Lucent Technologies
Bell Labs Innovations

DEFINITY®
Enterprise Communications Server
Release 6
Overview

555-230-024
Comcode 108136169
Issue 5
January 1998

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Part 68: Network Registration Number. This equipment is registered with the FCC in accordance with Part 68 of the FCC Rules. It is identified by FCC registration number AS593M-13283-MF-E.

Part 68: Answer-Supervision Signaling. Allowing this equipment to be operated in a manner that does not provide proper answer-supervision signaling is in violation of Part 68 Rules. This equipment returns answer-supervision signals to the public switched network when:

- Answered by the called station
- Answered by the attendant
- Routed to a recorded announcement that can be administered by the CPE user

This equipment returns answer-supervision signals on all DID calls forwarded back to the public switched telephone network. Permissible exceptions are:

- A call is unanswered
- A busy tone is received
- A reorder tone is received

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The "CE" mark affixed to the DEFINITY® equipment described in this book indicates that the equipment conforms to the following European Union (EU) Directives:

- Electromagnetic Compatibility (89/336/EEC)
- Low Voltage (73/23/EEC)
- Telecommunications Terminal Equipment (TTE) i-CTR3 BRI and i-CTR4 PRI

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About This Book

What Is the Purpose of This Book?

This book provides general information about the components and capabilities of the DEFINITY® Enterprise Communications Server (referred to as DEFINITY ECS or the system). It also discusses practical and creative applications for the DEFINITY ECS platform.

This document covers information related to DEFINITY ECS Release 6, and includes all incremental releases up to and including Release 6.2. For details about changes for Release 6.1, refer to *DEFINITY Enterprise Communications Server Release 6.1, Change Description, 555-230-474, Issue 1*. For details about changes in R6.2, refer to *DEFINITY Enterprise Communications Server R6.2 Change Description, 555-230-476, Issue 1*.

Who Should Read This Book?

This book is written for those who are considering the purchase of a DEFINITY ECS system and for Lucent Technologies representatives and distributors who need high-level information about the system and how it can be used.

What Is in This Book?

This book discusses all DEFINITY capabilities available world-wide. It defines common, practical solutions and suggests unusual, creative ones.

NOTE:
Some products are unavailable in some countries. Please check with your local distributor for further information about which features and solutions are available to you.

This overview of DEFINITY ECS is composed of the following chapters:

- *Chapter 1, "Introduction"* — outlines basic advantages, capabilities, hardware and software components and system configurations.
- *Chapter 2, "Industry Applications"* — discusses how DEFINITY ECS meets the communications requirements of several example industries.
- *Chapter 3, "Call Center Solutions"* — discusses features that help you set up and manage an efficient call center.
- *Chapter 4, "Computer-Telephone Integration Solutions"* — discusses features that merge computer and telephone functions.
- *Chapter 5, "Hospitality Solutions"* — discusses products and features particularly useful in the hospitality (lodging) industry.
- *Chapter 6, "Mobility Solutions"* — discusses products and features that allow you to keep in touch with colleagues and clients while moving about freely inside and outside the workplace.
- *Chapter 7, "Telecommuting Solutions"* — discusses features and products that allow you and your associates to work effectively off-site.
- *Chapter 8, "Data Management Solutions"* — discusses features that help you manage telecommunications information.
- *Chapter 9, "Voice Processing Solutions"* — discusses DEFINITY ECS features that help you handle incoming and outgoing calls efficiently.
- *Chapter 10, "Desktop Solutions"* — discusses features that are available at your desktop computer or telephone.
- *Chapter 11, "Multimedia Solutions"* — discusses features that allow you to send and receive synchronized voice and image information.
- *Chapter 12, "Networking Solutions"* — discusses features that help you network DEFINITY ECS with itself and with other equipment.
- *Chapter 13, "Service Upgrade Solutions"* — discusses the advantages inherent in the process of upgrading telephone service using DEFINITY ECS.
- *Chapter 14, "System Management Solutions"* — discusses the many ways in which you can manage the DEFINITY ECS and related systems.
- *Appendix A, "Features"* — summarizes the features discussed in this book.
- *Appendix B, "System Capacity Limits"* — contains Table B-2 that lists the capacity of each feature.
- *Appendix C, "References"* — lists and describes additional DEFINITY ECS documents.

A glossary, including abbreviations, and an index are also provided at the back of the book.

How Should I Use This Book?

You will probably want to read or skim the Chapter 1, "Introduction" first to get a basic understanding of the DEFINITY system. Chapter 2, "Industry Applications" is a good place to go next, because it discusses in general terms specific applications that may help you apply DEFINITY ECS creatively. It probably does not describe your industry or situation exactly, but scanning several of the examples may help you generate ideas about similar solutions you might apply.

Read the more in-depth discussions of general applications in Chapters 3 through 14 selectively, focusing on the solutions that suit your circumstances.

Appendix A lists all DEFINITY features, and includes a short description of each. These feature descriptions may help you understand specific features as well as the scope of DEFINITY ECS's capabilities. The remainder of the book is composed of reference material.

Conventions Used in This Book

The following conventions are used in this book:

- The word "*system"* is a general term for the DEFINITY Enterprise Communications Server.
- The information in this book refers to DEFINITY ECS Release 6 unless otherwise specified.

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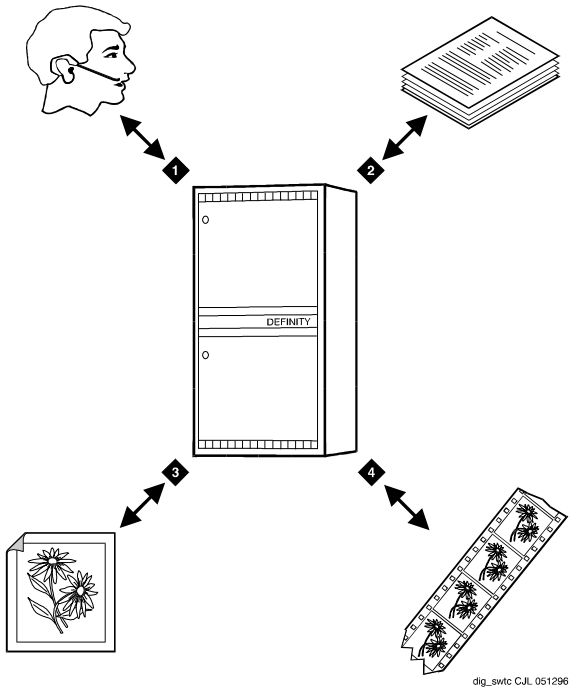
If the reader comment card is missing, fax your comments to 303-538-1741, and mention this document's name and number, *DEFINITY Enterprise Communication Server Overview*, 555-230-024, Issue 5.

Introduction

1

DEFINITY Enterprise Communications Server (ECS) organizes and routes voice, data, image and video transmissions Figure 1-1. To streamline the handling of different types of data, the transmitted information is digitized (distilled into representative sequences). The system can also receive and transmit analog (undigitized) information, which is digitized internally by the system.



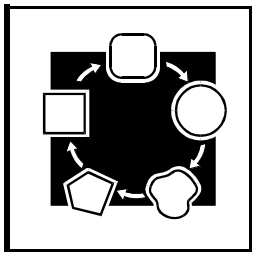
1) Voice
2) Data
3) Image
4) Multimedia

Figure 1-1. DEFINITY Enterprise Communications Server

DEFINITY ECS Advantages

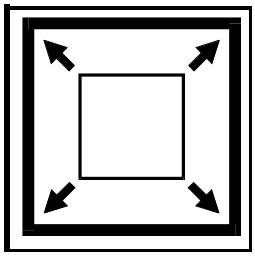
The DEFINITY ECS is the first truly global multimedia platform. It handles multimedia traffic as efficiently as any system available, while its state-of-the-art design further enhances Lucent Technologies' reputation for world-class reliability. The system not only accommodates but also integrates most related equipment throughout the world. Its modular design anticipates growth and change. All this translates to an exciting array of practical and creative applications for your business.

Adaptable



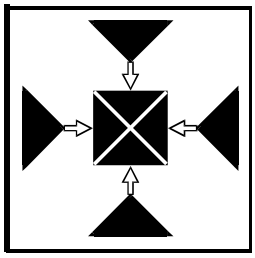
DEFINITY ECS's open architecture and modular design make it compatible with a wide variety of hardware and software — both Lucent tools and tools from other vendors. These may include personal and shared computers, terminals, computer networks, telephones, fax machines, and multimedia equipment. Multilingual options are available for messaging, call-related displays, and many related applications. The system was designed to accommodate existing and anticipated global communications standards and protocols. It is adaptable to varying standards world-wide, providing efficient service even when connected to conventional networks.

Expandable



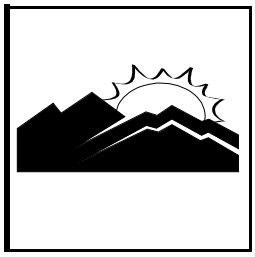
Modular port circuits, carriers (circuit shelves), and cabinets can be added to accommodate growth. Each DEFINITY ECS can also be networked to additional systems (DEFINITY ECS or other types) to service many simultaneous voice, data, image and video transmissions. These networks can be either centralized or geographically widespread. Regardless of configuration, the system is always expandable, for moderate incremental cost. This seamless expandability, from 80 to 29,000 ports, is perhaps the most important advantage of DEFINITY ECS. In addition, the platform makes available a creative array of options designed to anticipate growth and change in your business.

Integrating



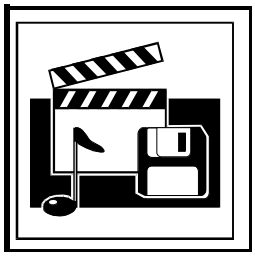
Sometimes the most important function of the DEFINITY ECS is its control and coordination of all your desktop tools and shared resources. It not only communicates with most networks and equipment throughout the world, but unifies them by translating protocols and standards as necessary. The system is designed to accommodate multimedia and network integration tools. It also offers many features that integrate computer and telephone. DEFINITY ECS's integrating capabilities and its association with many leading-edge tools make it a good investment for future growth. These attributes also enhance the value of your related investments.

Reliable/Recoverable



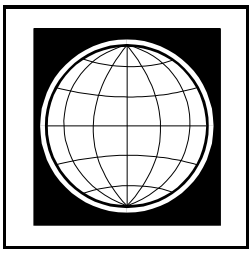
DEFINITY ECS is inherently reliable by design. That reliability can be enhanced by redundant configurations (see "Configuring for Reliability/Recoverability" in this chapter). Every essential component in the system is designed to be duplicated. For these reasons, adjacent systems (network, power supply, etc.) are far more likely than the DEFINITY ECS itself to fail. If something connected to the system should fail, the DEFINITY ECS keeps working until those systems are restored. If the disturbance is great enough that the DEFINITY ECS is also disabled, the system's modular design provides you many options for getting your communications back into service quickly.

State of the Art



DEFINITY ECS is the first telecommunications system to manage bandwidth precisely, which allows it to handle high bandwidth multimedia information while still conserving resources. It is also the first telecommunications system to use RISC (reduced instruction set computer) processors. The system is designed to accommodate anticipated innovations such as ATM (Asynchronous Transfer Mode).

DEFINITY ECS: A Global Multimedia Platform



DEFINITY ECS has been installed in more than 90 countries. It is the first truly global multimedia platform:

- It is compatible with a wide variety of tools, from group video systems to desktop network management applications and much more.
- It accommodates existing and emerging world-wide standards and protocols.
- Using bandwidth-on-demand, it provides the most efficient multimedia transmissions available.
- It offers multilingual options for many applications.
- It is designed to accommodate new innovations as they emerge.
- It is inherently reliable and provides many options for recovering quickly if disabled.
- It expands easily to accommodate your future needs.

World-class call features and multilanguage displays and voice prompts speed your communications with customers and associates around the globe. Messaging services enhance communication and productivity within your organization and enable business transactions across multiple time zones. You can even have calls received after business hours relayed to an office still open for business in another part of the world. This saves the cost of round-the-clock staff and keeps your customers in touch with your best agents.

NOTE:
Some applications and products are unavailable in some countries. Please check with your local distributor for further information about which features and applications are available to you.

International Capabilities

DEFINITY ECS provides features that allow for differences in telecommunication standards around the world, allowing you to use the same communications system at your various locations in other countries. If you are reading this book, it is likely that the system has been type approved in your country. Check with your local distributor for more information.

For more detailed information on the system's robust international capabilities, see the *DEFINITY ECS Release 6 System Description Pocket Reference, Issue 3,* 555-230-207, and *DEFINITY ECS Release 6 Administration and Feature Descriptions, Issue 2,* 555-230-522.

Hardware

Though the primary components are the same, your DEFINITY ECS can vary widely in size and appearance, depending on your capacity requirements. It may be as small as a single wall-mounted cabinet, or it may be as large as several tall cabinets linked together in the same room or even hundreds of kilometers apart. Regardless of configuration, however, the system's footprint is relatively small.

DEFINITY ECS's main hardware components are port networks. Up to three port networks can be connected directly to each other. When there are more than three port networks, the connections are made through a Center Stage Switch.

Processor Port Network

Every DEFINITY ECS has one Processor Port Network; it is often the only component in small systems. The Processor Port Network houses the Switch Processing Element.

The Switch Processing Element contains the central processing unit, which supervises system operation. It also contains a mass storage system for loading system software and saving system translations.

Because your application requirements may vary widely, DEFINITY ECS has three types of Switch Processing Elements available with proven capacities of 70,000 calls per hour, 140,000 calls per hour, and 250,000 calls per hour. The performance you realize will depend on the call processing, administrative, and maintenance activities in which your system is engaged.

Expansion Port Network

Expansion Port Networks are used when the system grows beyond the capacity of a single port network or must serve geographically dispersed offices. They provide additional ports as needed. A system can have up to 43 Expansion Port Networks.

Center Stage Switch

The Center Stage Switch is a connection hub that provides port network communication. It is an essential component of a DEFINITY ECS configuration if the system is composed of more than three port networks. Often it is incorporated in smaller configurations to allow for growth. The Center Stage Switch consists of from one to three switch nodes. Switch nodes are composed of one or two switch node carriers, depending on whether the system is being duplicated for enhanced reliability. Each carrier can reside in the Processor Port Network cabinet or an Expansion Port Network cabinet. One switch node can accommodate up to 15 Expansion Port Networks.

Carriers and Cabinets

Carriers are enclosed shelves composed of vertical slots that hold circuit packs. Circuit packs make up the logic, memory, and switching circuitry for the system. Port circuit packs connect to telephones, computers, and communications lines. The carriers are designed to accept any type of port circuit pack in each circuit pack position.

Each cabinet contains at least one carrier. The circuit packs fit into connectors attached to the rear of the slots. Every connector is connected to signal buses and power supplies in the cabinet. The cabinets also house equipment that supplies power backup, ringing signal voltage, and mass storage for software translations.

There are four types of cabinets:

- Compact Single-Carrier Cabinet. This cabinet, which can be mounted on a wall, houses small system configurations for small organizations. It contains one Processor Port Network and does not connect to any Expansion Port Networks.
- Compact Modular Cabinet. This cabinet is similar to the Compact Single-Carrier Cabinet, but up to three of the cabinets can be connected together.
- Single-Carrier Cabinet. These cabinets are modular, can be connected to Expansion Port networks, and can be stacked up to four high. They are often used by small businesses that are growing or expect to grow. The
- Multicarrier Cabinet. A tall cabinet that contains up to five carriers and can be connected to Expansion Port networks. Multicarrier Cabinets are used by large organizations that require larger configurations.

Compact Single-Carrier Cabinets

Figure 1-2 shows a compact single-carrier cabinet with a hinge for attaching it to a wall.

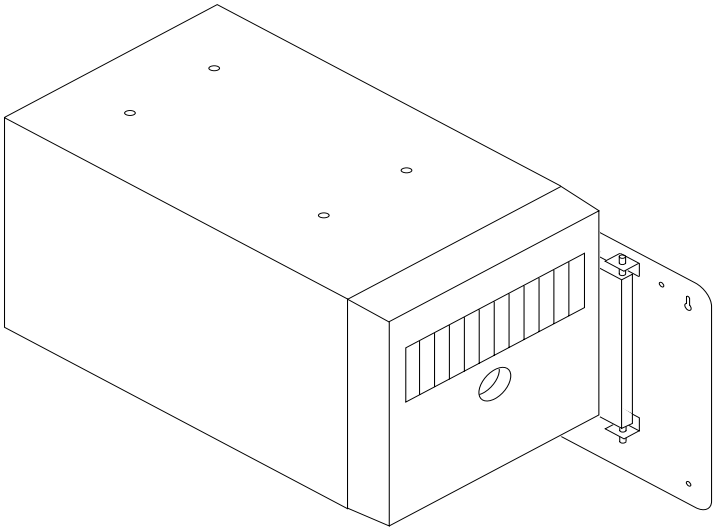


Figure 1-2. Compact Single-Carrier Cabinet

The compact single carrier cabinet has the following characteristics:

- It provides DEFINITY features and applications in a small package.
- It is the only cabinet required for small organizations.
- It can be mounted on a wall.
- It contains both dedicated and universal port slots: three dedicated control circuit packs and ten port slots.

The Compact Single-Carrier Cabinet is used as a Processor Port Network only. A new version of this cabinet now supports ISDN BRI lines, ASAI, and PRI over PACCON.

Compact Modular Cabinets

Figure 1-3 shows a Compact Modular Cabinet.

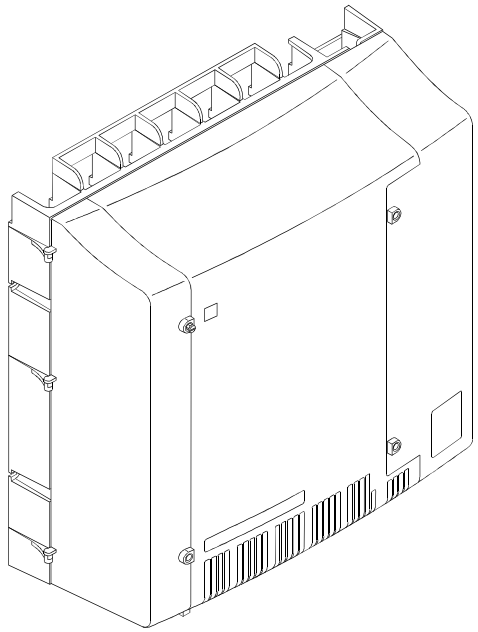


Figure 1-3. Compact Modular Cabinet

The compact modular cabinet has the following characteristics:

- Up to three cabinets can be connected together.
- It allows small organizations to expand while keeping the initial investment moderate.
- It can be mounted on a wall.
- It contains ten universal port slots.
- The first two universal port slots in the first cabinet are dedicated to the processor complex.

The Compact Modular Cabinet is used as a Processor Port Network only.

Single-Carrier Cabinets

Figure 1-4 shows a typical single-carrier cabinet.

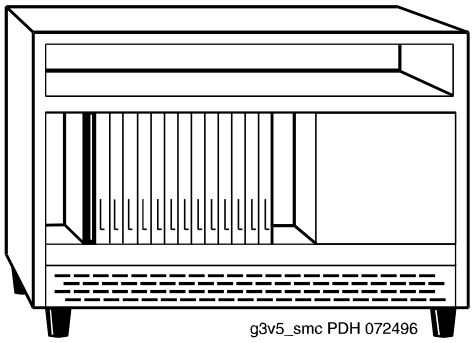


Figure 1-4. Typical Single-Carrier Cabinet

A maximum of four single-carrier cabinets can be stacked on top of each other to form a single Processor Port Network or Expansion Port Network. There are four types of single-carrier cabinets:

- Control cabinet (located in the Processor Port Network only), which contains ports, a control complex (for call processing), and an optional interface to a duplicated control cabinet.
- Duplicated control cabinet (optional and located only in the Processor Port Network), which contains a duplicated control complex, ports, and an interface to an expansion control cabinet.
- Expansion control cabinet (optional and located only in an Expansion Port Network), which contains ports, a tone-clock, an interface to a Processor Port Network cabinet, and a maintenance interface.
- Port cabinet (located in the Processor Port Network and in Expansion Port Networks), which contains ports and an interface to an expansion control cabinet.

Figure 1-5 shows a typical cabinet stack.

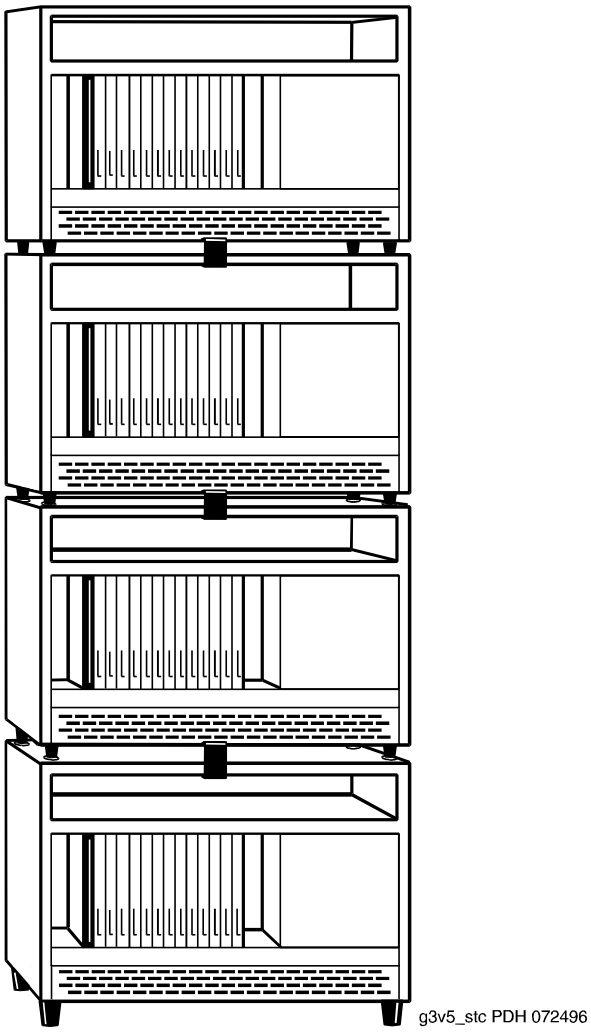


Figure 1-5. Typical Cabinet Stack (Four Cabinets Maximum)

Multicarrier Cabinets

Figure 1-6 shows a typical multicarrier cabinet.

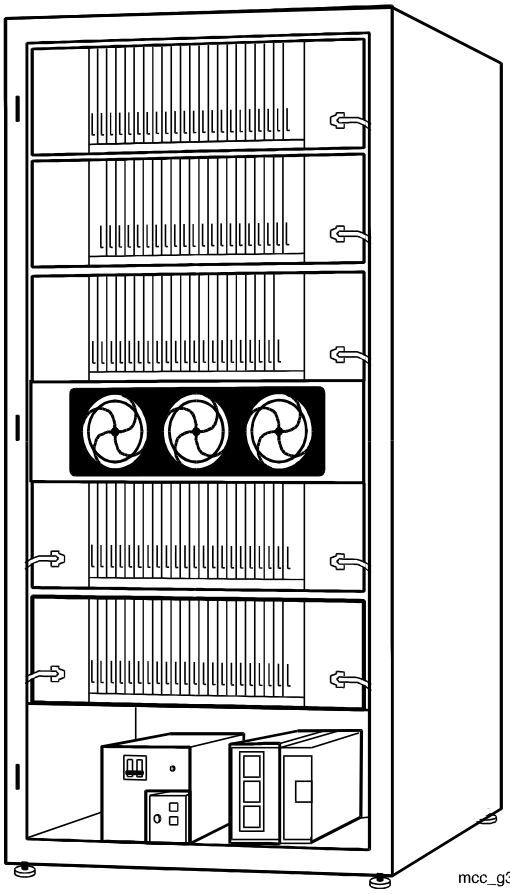


Figure 1-6. Typical Multicarrier Cabinet

There are three types of multicarrier cabinets:

- The Processor Port Network cabinet, which contains:
  - The processor that performs call processing
  - Ports
  - An interface to an Expansion Port Network cabinet (optional)
  - A Center Stage Switch (optional)

- The Expansion Port Network cabinet, which contains:
  - Additional ports
  - Interfaces to the Processor Port Network cabinet and other Expansion Port Network cabinets
  - Maintenance interface
  - Components of a Center Stage Switch (optional)
- The auxiliary cabinet, which contains equipment used for optional system-related hardware

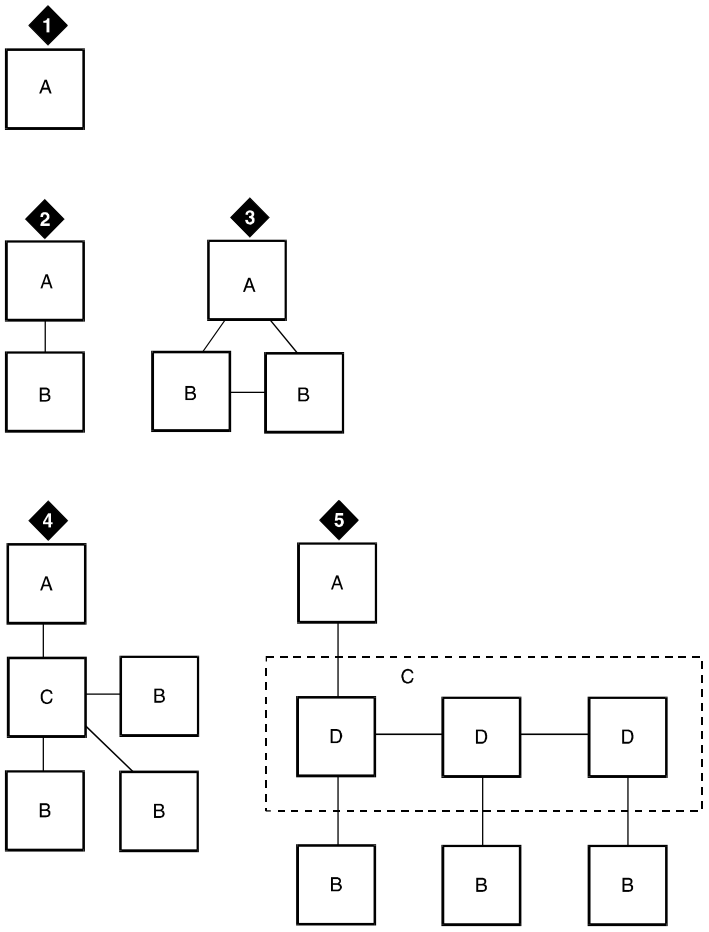
Control, duplicated control, expansion control, port, and switch node carriers can be installed in multicarrier Processor Port Network and Expansion Port Network cabinets. (See the descriptions of these carriers in the previous section "Single-Carrier Cabinets".)

For more detailed hardware information, see the *DEFINITY ECS Release 6 System Description Pocket Reference, Issue 2,* 555-230-211.

Standard Configurations

The DEFINITY ECS hardware can be configured in a variety of ways, depending on the number of endpoints the switch serves and the number of circuit packs required to connect the endpoints.

Figure 1-7 shows the five main system configurations.



1) Basic System
2) Directly Connected System
3) Directly Connected System with Two EPNs
4) CSS-Connected System with up to 15 EPNs
5) CSS-Connected System with up to 43 EPNs

A) Processor Port Network
B) Expansion Port Network
C) Center Stage Switch
D) Switch Node

Figure 1-7. Standard Configurations

The main configurations are:

1. Basic system consisting of a Processor Port Network (PPN) only.
2. Directly-connected system consisting of two Port Networks (PNs): one PPN and one Expansion Port Network (EPN) connected directly together.
3. Directly-connected system consisting of three PNs (one PPN and two EPNs) connected directly together.
4. Center Stage Switch-connected system consisting of up to 15 EPNs interconnected by one Switch Node (SN) to the PPN.
5. Center Stage Switch-connected system consisting of up to 21 EPNs interconnected by two SNs to the PPN, and up to 43 EPNs interconnected by three SNs to the PPN.

Direct-Connect Configurations

Direct-connect configurations have these distinguishing characteristics:

- Every port network is connected to every other port network via an expansion interface circuit pack and a fiber optic cable.
- Each fiber is connected to a fiber transceiver that can transmit great distances.

In large systems, a port network can be hundreds of kilometers away from the central site. These remote port networks are connected to the other port networks via a Digital Signal Level 1 (DS1 — T1 or E1) link attached to a converter board, which in turn is connected to the expansion interface. The converter board converts the fiber optic signals between DS1 protocol and the internal expansion interface protocol so the signal can travel over dedicated public or private lines.

Center Stage Switch Configurations

Center Stage configurations have these distinguishing characteristics:

- An expansion interface in every port network is connected to a switch node interface in the Center Stage Switch.
- Remote Expansion Port Networks require T1/E1 Converter pairs at the remote end and switch node T1/E1 Converter pairs at the switch node. In the pairs, the T1/E1 Converter board converts the fiber optic signals between T1/E1 protocol and the internal expansion interface protocol so the signal can travel over dedicated public or private lines.
- Switch node interfaces and fiber optic cables are also required for communication between switch node carriers. The number of switch node interfaces required depends on the call traffic between port networks whose switch node interfaces reside in different carriers.

Reliability and Recoverability

The system is designed to recover from a power outage or other failure instantly, regardless of the source of the failure. Each port network includes a set of segmented, parallel buses. If one of the paired segments fails, the other bus segment continues to handle communications. You can always further enhance the system's reliability by duplicating critical components such as processors or fiber-optic links between port networks.

In systems with duplicated control carriers, the entire processor complex is duplicated in the processor cabinet. Should the active elements fail, the standby elements are instantly activated and assume system control. All in-process calls and system activities are maintained. New user service is restored in about 10 seconds; application links recover within two seconds.

In addition, all system I/O links also stay operational. These links include support for the Call Management System, the CallVisor Adjunct/Switch Applications Interface, a Distributed Communications System, and the INTUITY AUDIX Voice Messaging System. Redundancy is built into the packet bus, and higher packet bus reliability can optionally be achieved by adding a maintenance/test circuit pack to each port network.

Memory shadowing, a unique DEFINITY ECS capability, is a function where the memory in the standby processor is continuously updated to reflect the memory in the active processor. This permits the system to change from one processor to another without any noticeable interruptions in service. Memory shadowing is not only important for maintaining basic intercom, incoming, and outgoing calls, but also for complex calling processes such as queuing and call vectoring operations.

Much of DEFINITY ECS's reliability and recoverability is attributable to the switch architecture and the power of the system software. The distributed processor architecture provides subsystem processors on each circuit pack, for example. A standard maintenance routine is conducted automatically by the system, as are periodic backups of translations. All of this inherent reliability/recoverability can be further enhanced by redundancy in system configuration.

Configuring for Reliability/Recoverability

DEFINITY ECS can be configured to meet the disaster recovery needs of any business. For example:

- Calls can be routed through an alternate DEFINITY ECS if one site is destroyed or disabled by natural or man-made disaster.
- Multimedia (voice, video, data) connections to the network can all be made redundant, in case of network failures. The system can be routed through multiple public exchanges to protect against network failures (a cable or fiber being cut, for example).

- DEFINITY's universal hardware and flexible software allow systems to be reconfigured quickly in emergency situations. Port networks can be added and network routing can be changed in a matter of minutes.

Based on the needs of your organization, three redundancy configurations are available:

- Standard Reliability
- High Reliability
- Critical Reliability

Standard Reliability

The built-in duplication of many of its parts makes the system inherently reliable. In addition to the dual bus, the system includes:

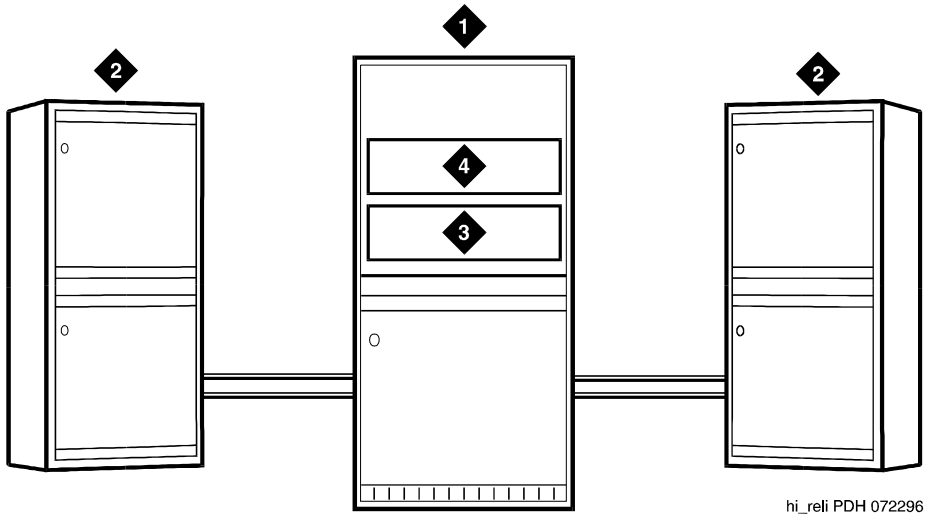
- One control carrier
- One tone-clock circuit pack per port network
- Port networks interconnected by single fiber cables

High Reliability

High reliability systems include the following:

- Two control carriers (located in the Processor Port Network cabinet), which contain duplicate processor and tone-clock circuit packs (one is active and the other is in standby)
- One tone-clock circuit pack per Expansion Port Network
- Duplicate connections between the Center Stage Switch and the Processor Port Network
- Expansion port networks connected by single fiber cables
- Duplicate switch node clock circuit packs (one is active and the other is in standby) in each switch node carrier

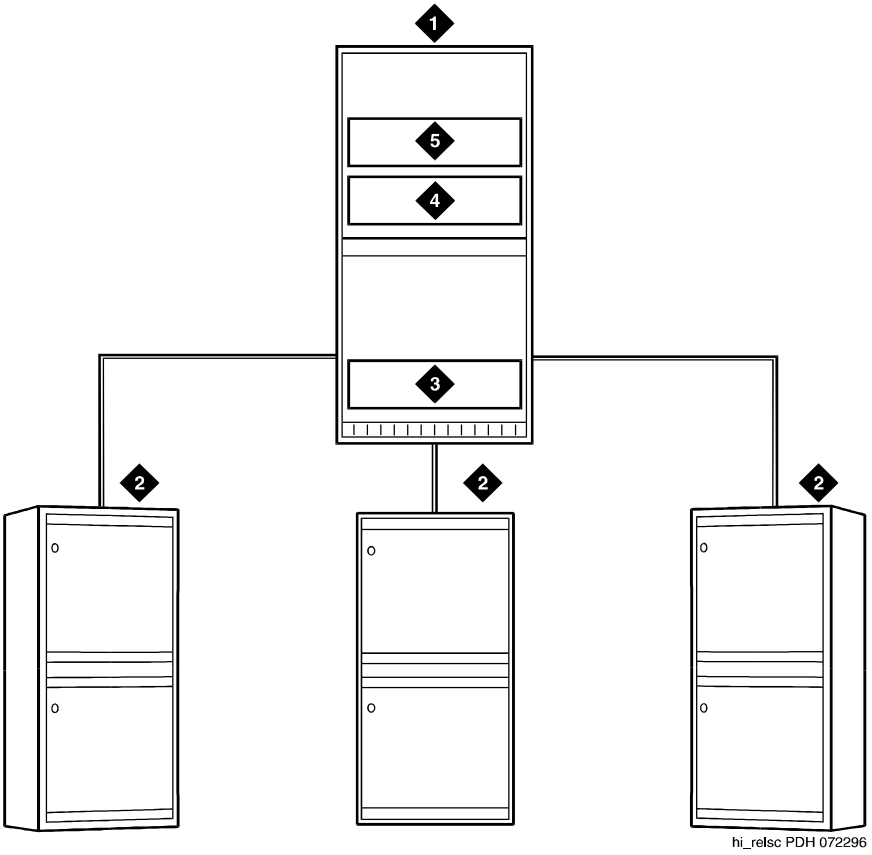
Figure 1-8 shows a high reliability, directly connected system.



1) Processor Port Network
2) Expansion Port Network
3) Control Carrier
4) Duplicate Control Carrier

Figure 1-8. High Reliability, Directly Connected DEFINITY ECS

Figure 1-9 shows a high reliability center stage system, where the Center Stage Switch is connected to both the active and standby control carrier.



1) Processor Port Network
2) Expansion Port Network
3) Center Stage Switch
4) Control Carrier
5) Duplicate Control Carrier

Figure 1-9. High Reliability Center Stage DEFINITY ECS

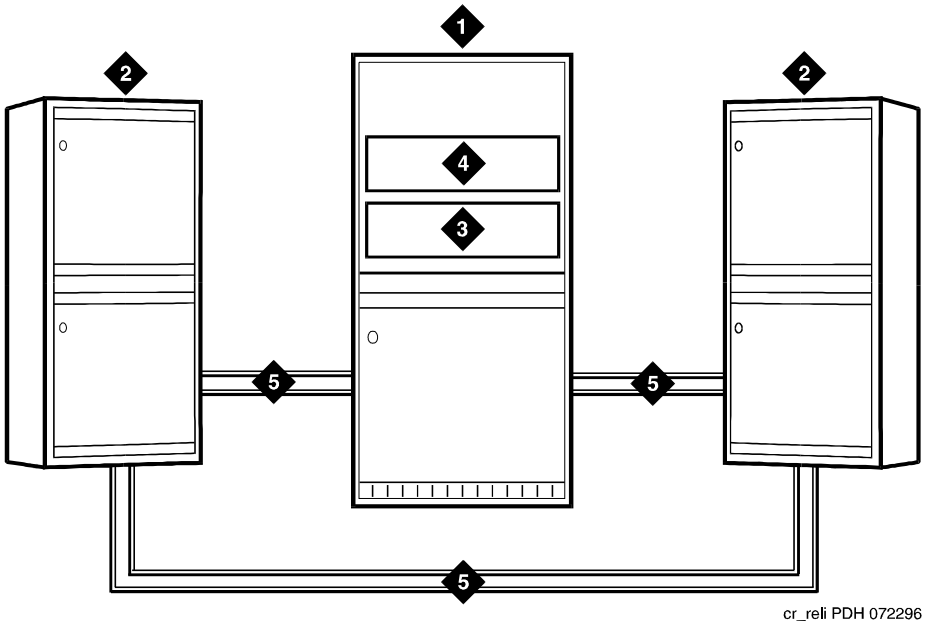
Critical Reliability

Critical reliability systems are fully operational over 99 percent of the time, on average. No other switch vendor offers this level of system redundancy.

A critical reliability DEFINITY ECS includes:

- Two control carriers
- Two tone-clock circuit packs in each port network
- Two connections between port networks or between Expansion Port Networks and the Center Stage Switch
- Two switch node carriers in center-stage systems

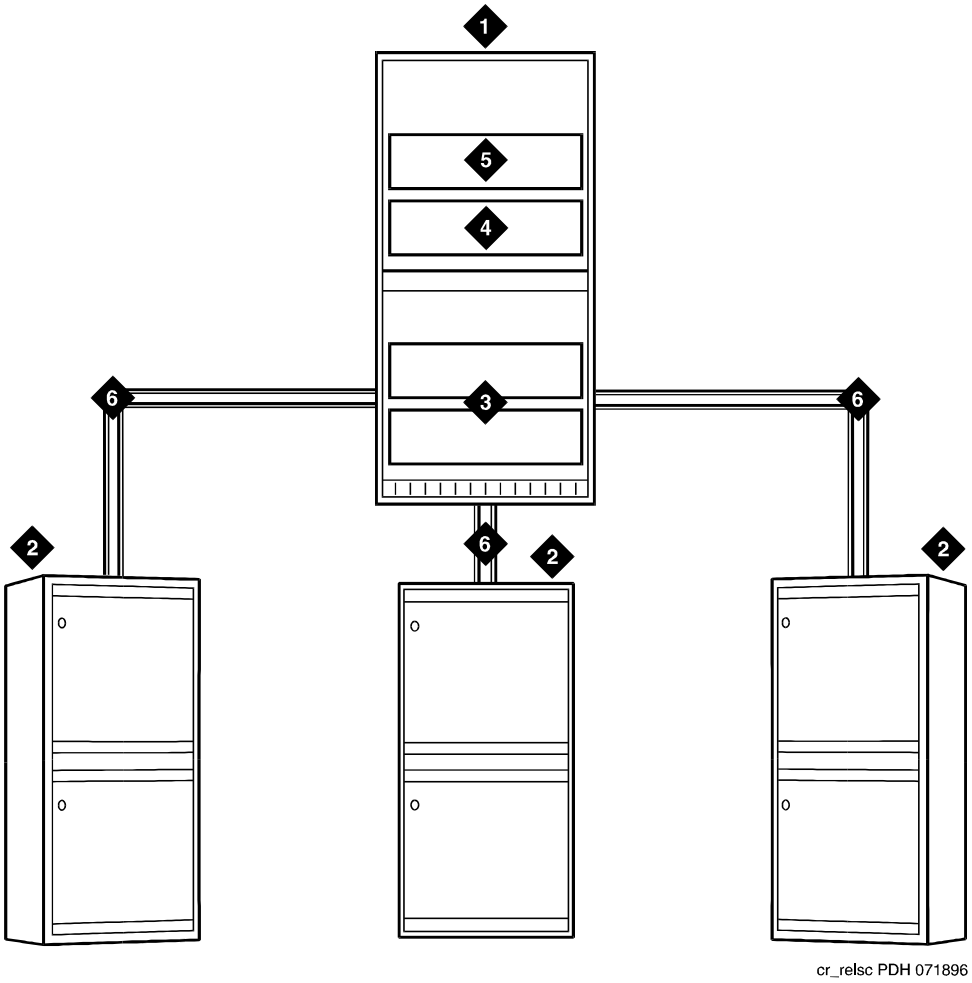
Figure 1-10 shows two control carriers and duplicate fiber-optic cables that connect each port network in a critically reliable, directly-connected system.



1) Processor Port Network
2) Expansion Port Network
3) Control Carrier
4) Duplicate Control Carrier
5) Fiber Optic Cables

Figure 1-10. Critical Reliability, Directly Connected System

Figure 1-11 shows two control carriers and two Center Stage Switches in a critical reliability, Center Stage duplex system. As shown in Figure 1-11, a fiber-optic cable connects each port network to the Center Stage Switch, and another fiber-optic cable connects each Center Stage Switch to the duplicate Center Stage Switch.



1)	Processor Port Network	4)	Control Carrier
2)	Expansion Port Network	5)	Duplicate Control Carrier
3)	Center Stage Switches (2)	6)	Fiber Optic Cable

Figure 1-11. Critical Reliability Center Stage ECS System

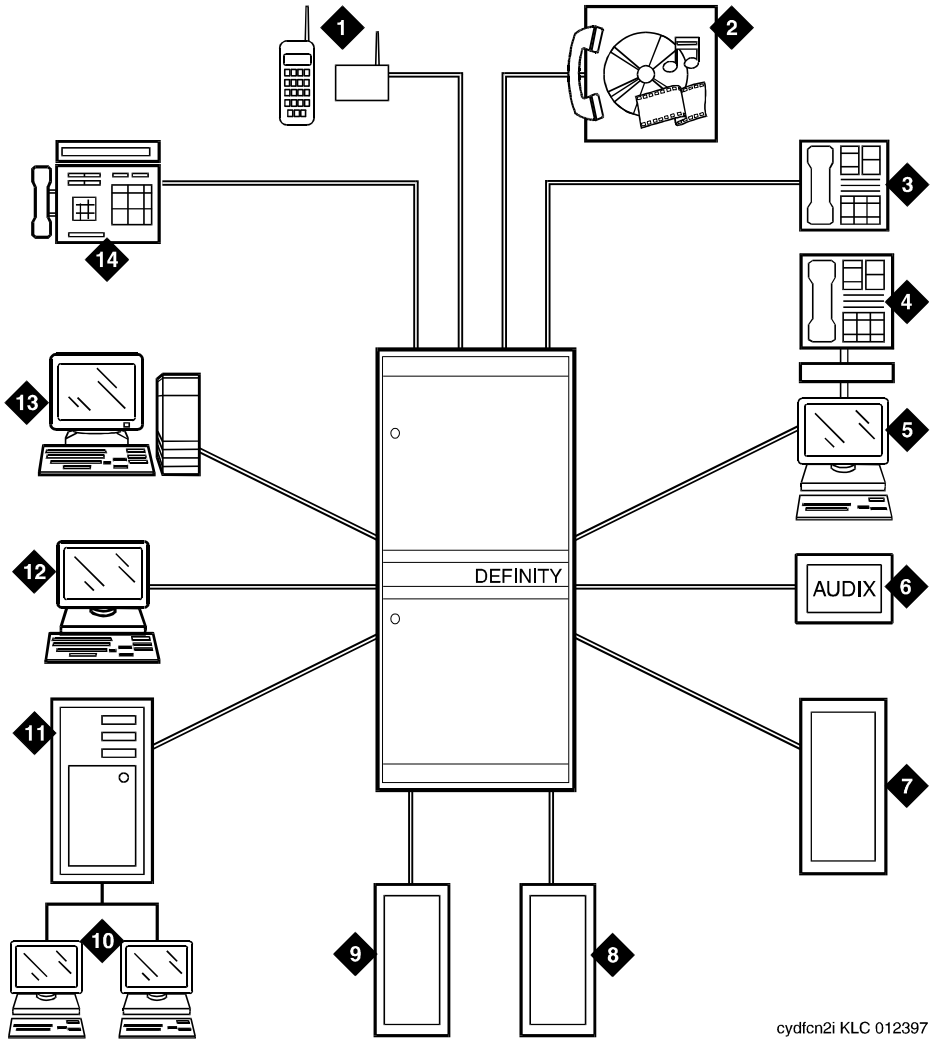
Connections to ECS

DEFINITY ECS can be connected to communications paths that transmit voice and data signals between the system and a Central Office and/or other systems. The system can also be connected to public and private networks. Other possible connections are:

- Data Communications Equipment, such as a data module, which translates transmitted data to a form compatible with the communications channel.
- Data Terminal Equipment, such as a workstation, which generates or receives data.
- Other peripherals for administering and maintaining the system and auxiliary equipment for features such as Loudspeaker Paging and Music-On-Hold.

Figure 1-12 shows typical DEFINITY ECS connections.

NOTE:
Actual equipment may appear different than the equipment shown.



1) Wireless System
2) Multimedia Call Center
3) Business Telephone
4) Telephone with Data Module
5) Data Terminal
6) Voice Messaging System
7) Outside Private Line Data Transmission Equipment
8) Digital Facilities
9) Analog Facilities
10) Data Terminals
11) Host Computer
12) Data Terminal
13) Management Terminal
14) Attendant Console

Figure 1-12. Typical DEFINITY ECS Connections

Adjunct Connections

In addition to station connections, DEFINITY ECS includes many connections for adjunct (subordinate, related) equipment. The system provides an advanced X.25 (called BX.25) dedicated link adjunct interface, which can support a variety of adjuncts, including:

- DEFINITY AUDIX Voice Processing System (internal)
- INTUITY AUDIX Voice Processing System
- Call Management System

The BX.25 interface is also used between DEFINITY ECS systems for Distributed Communications Service.

DEFINITY ECS also uses an analog Mode Code interface for communications with INTUITY AUDIX and adjuncts produced by other venders. This interface employs DTMF tones, line signals, and feature access codes, and allows adjuncts to exchange data with the DEFINITY ECS without using a data link.

DEFINITY ECS provides Electronic Industries Association (EIA) RS-232 ports for management terminal connections to the active processor and, in the case of duplication, for management terminal connections to the standby processor. In addition, a tip/ring connector with a built-in modem is provided for remote administration.

The Expansion Port Network maintenance circuit pack has a single EIA RS-232 port for connecting a management terminal. Data between the processor complex and the Expansion Port Network maintenance circuit-pack port is multiplexed onto the fiber optic link connecting the Expansion Port Network to the Processor Port Network. The terminal on the Expansion Port Network maintenance circuit pack has the full capabilities of any other management terminal, but operates at a lower speed.

Other RS-232 ports connect to the following typical adjuncts:

- Property Management System
- Call Detail Recording Units
- G3 Management Applications
- Call Detail Recording printer
- Basic Call Management System terminals
- System printer

DEFINITY ECS supports CallVisor Adjunct/Switch Applications Interface messages over ISDN-BRI lines or over the DEFINITY LAN Gateway. CallVisor Adjunct/Switch Applications Interface allows adjunct computers access to DEFINITY ECS features and information for computer/telephone integration applications. CallVisor Adjunct/Switch Applications Interface and DEFINITY ECS support the following typical adjuncts and applications:

- Inbound Call Management
- DEC Computer Integrated Telephony programming library
- Computer telephony integration

DEFINITY ECS uses an analog line circuit to support voice adjunct and interface functions such as:

- Loudspeaker paging
- Music-on-hold
- Queue status indications
- Recorded announcement
- External alarm inputs

DEFINITY ECS supports an auxiliary trunk interface that connects to equipment supporting features such as:

- Recorded announcement
- Music-on-hold
- Loudspeaker paging

DEFINITY ECS supports typical network interfaces such as:

- Electronic Tandem Network
- Distributed Communications System — over either X.25 links or ISDN temporary signaling connections
- ISDN-PRI

Telephone Connections

All signals between analog telephones and the DEFINITY ECS are in analog form over a pair of wires. Digital DCP telephones using the Digital Communications Protocol employ digital transmission for integrated voice and data signals and control signals. Transmission is over a connection consisting of one or two pairs of wires. Each connection supports one signaling channel and two information (voice and data) channels.

The 8400 digital telephones automatically detect whether they are plugged into a two-wire or four-wire digital line circuit pack. The 9400 digital telephones provide inexpensive support for two-wire installations. The 6400 digital telephones provide state-of-the-art features for two-wire installations. See Chapter 10, "Desktop Solutions" for more information on telephones.

Like the digital DCP telephones, ISDN telephones transmit voice, data, and control signals digitally. With the ISDN telephones, the transmission employs the world-wide standard BRI protocol between the DEFINITY ECS and the telephone.

Network Connections

Lucent Technologies has been a leader in providing compatibility with the Q-SIG global networking protocol. This means you can connect the DEFINITY ECS with other switches throughout the world. Q-SIG Global Networking was developed to comply with the Q-SIG standards developed by the European Computer Manufacturer's Association and the International Standardization Organization. It supports the ISDN-PRI connection from switch to switch as long as both systems support the same protocol options.

Lucent Technologies supports both T1 and E1 lines. As industry standards around the world, T1 and E1 provide the latest alternative to analog trunking. T1/E1 access and conversion allows simultaneous connection to both T1 (1.544 Mbps) and E1 (2.048 Mbps).

DEFINITY ECS's support of ISDN-PRI, ISDN-BRI, and available public network services means that you can achieve full end-to-end ISDN connectivity and take advantage of ISDN services and features. The system provides complete ISDN support in one system for small systems with 20 telephones up to large systems with over 25,000 telephones.

DEFINITY ECS also supports connection to an Electronic Tandem Network. Different Electronic Tandem Network locations are connected via analog or digital tie trunks. For example, a T1 or E1 interface can act as a high-speed digital backbone for voice and data communications between Electronic Tandem Network locations.

For Distributed Communications System (DCS) network connections, tie trunks interconnect the switches that serve the DCS complex. The tie-trunk network may be configured as a tandem tie-trunk network, a main/satellite/tributary network, or an Electronic Tandem Network. The links connecting a Distributed Communication System may also be provided across a Software Defined Network. To support DCS customers who also have ISDN-Primary Rate Interface, DEFINITY ECS can transport DCS messages over ISDN-Primary Rate Interface D channels. As a result, you are no longer limited to private-line connections between your various locations. You can also use public network services.

DEFINITY ECS's support of wideband signaling allows the system to handle applications with transmission rates greater than 64 Kbps in a single call. This includes videoconferencing, Local Area Network bridging, and other wideband applications. The system switches wideband data at N x DS0 data rates — a standard for international networking.

For more information, see Chapter 12, "Networking Solutions".

Remote Service

DEFINITY ECS's remote-service capabilities allow greater flexibility in configuring your system. Although the system has high capacity and supports up to 25,000 lines, you may need to serve some users who are far from the main system. To satisfy these needs, you can use remote Expansion Port Networks using fiber-optic links. For locations further apart, you can connect a port network remotely over one to four T1 or E1 lines using a converter.

The number of T1 or E1 lines required to support the remote port network depends on the requirements of the remote port network. For example, with four T1/E1 lines, a maximum of 92 or 120 simultaneous voice and/or data connections can be made between the remote port network and the DEFINITY ECS. Four channels are reserved for signaling between the remote port network and the system.

Power

DEFINITY ECS can accept a variety of AC or DC power. The system can operate without requiring a power transformer in almost any part of the world.

During a power outage, individual cabinets (single or multicarrier) will continue to function for up to 15 seconds; the multicarrier cabinet will function for up to 10 minutes without power, depending on configuration. Optionally, an uninterruptible power supply can protect a DEFINITY ECS system from under or over-voltage conditions, line frequency fluctuations, and power blackout of short duration. A battery backup system can be used to provide power for up to 8 hours, depending on the type and quantity of circuit packs and amount of traffic during the holdover period.

Software

All DEFINITY ECS systems throughout the world use the same basic software. To provide this commonality while still accommodating wide variations in configurations and options, the system dynamically allocates internal memory storage. Memory is sized when the system is initialized, selecting the proper software parameters based on the hardware configuration.

In addition to the basic software, various optional packages can enhance the capabilities of the system. Some of the capabilities described in this document require optional software. See your account representative for more information. The basic software is a prerequisite for all the optional packages.

Industry Applications

2

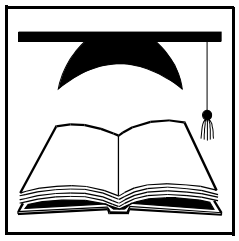
The following application discussions explain how the DEFINITY ECS meets communications challenges in various industries. Though the specific requirements of the industries vary throughout the world, the general information presented here should be useful for generating ideas. Even if none of the applications precisely match your situation, the examples may suggest creative solutions you can apply to suit your needs.

As technological and organizational change continues to accelerate worldwide, even the distinctions between industries are losing significance. In the financial services industry, for example, banks, brokerage houses and insurance companies now offer many of the same services. In this chapter, industries are presented in the broadest terms, with little regard for overlap. For example, the insurance industry can be considered under both the "Healthcare" and "Financial Services" headings.

In most cases it is difficult to consider DEFINITY ECS without also considering its array of options. Many of the solutions discussed in this chapter are enabled by optional hardware and software. The DEFINITY ECS is the essential integrating platform that coordinates and enhances these specialized tools. Even if your intention is to purchase a basic system, it is important to gain some understanding of the many options the system provides so you can eventually capitalize on those advantages.

NOTE:
Some applications and products are unavailable in some countries. Please check with your local distributor for further information about which features and applications are available to you.

Higher Education



University and college administrators continually seek to:

- Ensure reliable telephone service
- Organize course offerings and events
- Coordinate information and services
- Communicate easily with the outside world
- Teach many students for low cost
- Plan for expansion and innovation

Ensure Reliable Telephone Service

A large DEFINITY ECS can service up to 25,000 telephones, and the systems can be networked together to accommodate many more. The size and efficiency of the system allows universities to generate revenue from student phone service, which offsets the cost of other services.

The reliability of the system is without equal. The system's automatic backup features, maintenance tests, and line monitoring functions work proactively to protect your investment. These and related features identify potential difficulties well before the system's operations might be compromised, further enhancing the high reliability inherent in the DEFINITY ECS architecture.

Organize Course Offerings and Events

Registering students for classes usually requires setting up a special area, hiring extra staff, and having students wait in line. This is inconvenient, expensive, and time-consuming.

INTUITY CONVERSANT allows students to register by telephone. Here's one way you might set it up:

1. Each student dials the CONVERSANT number, then enters a student number and a unique security code.
2. The system locks out students who are not eligible to register.
3. The student enters the numbers of classes to be added or dropped.
4. While the student is entering the numbers, the system:
   - Recites the student's selections back to the student for verification.
   - Determines the availability of the requested courses and whether the student is eligible for them.
   - Rejects the classes that are not available to the student and asks the student to specify alternative courses.

- Calls and leaves a message for the appropriate teacher when a course nears its enrollment limit.
- Connects with the school's billing system to total fees or allow the student to pay with a credit card.

5. When the student is finished registering, the system faxes a copy of the course schedule.

Coordinate Information and Services

Many universities have enormous campuses or are composed of a network of scattered colleges and offices. Efficient connections among the many elements are essential to the integrity of the institution. A variety of DEFINITY ECS options can help coordinate information and services from many locations:

- Wireless and cordless telephones allow librarians, technicians and clerks to easily search for things while talking to the person requesting the search.
- Voice messaging systems can be digitally networked using existing voice and data networks. This allows satellite campuses or offices to access common directories and handle messages as if they were all on the same campus.
- INTUITY Message Manager keeps a record of all voice, data, or fax messages by category and sorts the information.
- A video kiosk set up in a central location gives students easy access to services that are located far away.
- Video conferencing equipment allows teachers and managers to easily participate in policy-making meetings, regardless of location.
- The security of all campuses can be coordinated and enhanced in the following ways:
  - — The DEFINITY Call Center efficiently routes emergency calls to security staff.
  - — DEFINITY PassageWay logs incoming calls and pinpoints the location of the telephone making the call, using DEFINITY's name/number display capability.
  - — Call Management Software logs the speed of the response so that response times can be measured and improved.

Communicate Easily with the Outside World

Most schools receive a huge number of incoming calls. The number of calls also fluctuates a great deal — going up just prior to the start of a semester, for example. Often the callers are unsure which department or individual they need to talk

to. The communications system must therefore be flexible enough to handle fluctuating call volume while satisfy each caller's particular needs. Here's how DEFINITY ECS's Call Center tools meet these needs:

- Automatic Call Distribution routes incoming calls to a group of operators who use equipment that allows them to handle multiple calls. As additional calls come in, they are placed in queue. When the queue gets too long, the overflow calls are automatically routed to standby operators during periods of high call volume. Display telephones alert the standby operators that they are handling overflow calls.
- The Expected Wait Time feature provides a reliable estimate of the time a caller will wait in queue before being connected to an agent. Based on that time, different choices are presented to the caller, such as remaining in queue, leaving a message for a later callback, or transferring to automated services (on INTUITY Conversant Applications). Callers are more comfortable waiting in queue when they know how long the wait will be and can choose alternate options.
- Call Management Software keeps statistics on number of abandoned calls, average length of call, average wait time, etc. so you can manage staff and track productivity.
- Expert Agent Selection and Call Prompting allow callers to identify special needs (such as language) and preferences and routes those calls to the appropriate operators.

The Internet also provides an important link to the outside world. Lucent's network access products — Acculink Access Controller and Acculink Bandwidth Controller — provide high-speed access while still managing resources efficiently. This can obviate the need for additional lines and equipment.

Teach Many Students for Low Cost

Educators now have many options for making the most of their resources while providing a top quality education for many students. DEFINITY ECS provides efficient, integrated access to both the school and to world-wide resources:

- DEFINITY ECS's "Distance Learning" video tools overcome barriers of time and distance by allowing students to work together and access classroom information regardless of location.
- Acculink access to the Internet (see "Communicate Easily with the Outside World") can put information at the fingertips of many students without wasting network resources.
- Speakerphones or more sophisticated interactive video tools allow distant experts to share knowledge with students in the classroom.

- Desktop Conferencing Systems enable students to see and speak with one another and also collaborate on documents. They can create and jointly edit documents that may reside on only one computer in one location. The students can work together as if they were all seated at the same table.
- TransTalk telephones help teachers and students solve software problems while talking with technical experts.
- DEFINITY ECS incorporates many efficiencies while providing this access because it manages bandwidth accurately. It can cost-effectively integrate voice, video and data calls over a single network access facility to a school's public or private network.
  - — It gives users switched access to a host computer over wideband (T1/E1) communication lines. Since DEFINITY ECS precisely allocates resources as needed, this speeds transmissions while allowing the system to handle more calls.
  - — It allocates bandwidth for data calls when permanent data circuits are busy.
- The MultiPoint Control Unit can seamlessly integrate with a DEFINITY network to coordinate video (voice and data) conference calls from 2-24 locations.

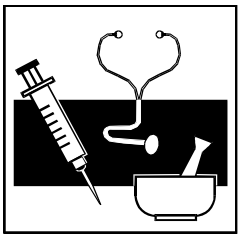
These tools allow schools to form partnerships with each other world-wide, enhancing the overall quality of education they offer while spawning new revenue-generating opportunities.

Plan for Expansion and Innovation

Schools must be at the forefront of communications innovation, so it's important to use a platform that can accommodate rapidly evolving requirements. DEFINITY ECS is:

- Designed to be easily enlarged or networked together to accommodate virtually any size requirement.
- Capable of handling multimedia (synchronized audio and video) calls today.
- Unmatched in its ability to handle voice, video and data traffic.
- Compatible with many different products from many different vendors so that it fully integrates all of your tools and options.
- Designed to accommodate existing and emerging standards and protocols.

Healthcare



The healthcare industry may include providers, insurance companies, employers, patients, researchers, pharmaceutical companies, and the government.

Healthcare administrators worldwide seek to:

- Maximize resources to reduce or contain costs
- Improve response in a busy urban environment
- Maximize productivity and efficiency of high-salaried professionals
- Provide highly efficient service, without losing the human touch
- Promote wellness and satisfaction with easy access to information within the community
- Improve accessibility to specialized medical care
- Maintain skills and collaborative relationships regardless of location

Maximize Resources to Reduce Costs

For individual healthcare providers, cost containment and reduction is the key to survival and growth. The rules of healthcare payment are changing, and providers must keep the costs of care down without sacrificing quality.

Beyond providing quality care — always an overriding concern — healthcare's primary goal is to maximize resources through efficient operation. Savings can be realized in reexamining everything from staff size and operations to the number and type of rooms provided.

DEFINITY ECS can provide a variety of options to fully use available resources. It can turn the telecommunications investment into a seamless network for managing and monitoring heavy call volumes and messaging, with the following results:

- Communicating between locations is easier
- System administration is centralized
- Information can be obtained by all locations from a single source

INTUITY CONVERSANT Interactive Voice Response System can help provide the following benefits:

- Contain costs with better room utilization

  Efficient room management is very important in the healthcare environment. Shorter stays make it challenging to keep rooms ready for reassignment. With INTUITY CONVERSANT, when a patient is discharged,

the escort enters a short code on the telephone. This indicates to the housekeeping staff that the patient has left, and the room is ready to prepare for the next patient. When the housekeeping staff has cleaned the room, they enter a code to alert admissions that the room can immediately be reassigned.

- Link to food and drug services

  When patients are discharged, the patient's meals are cancelled, thus saving wasted food that otherwise may have been delivered. The pharmacy is similarly notified so drugs are not delivered needlessly.

- 24-hour access to business office

  CONVERSANT's automated attendants can provide 24-hour access to the business office so patients and others can request account balances, copies of bills, etc.

- Pre-admission over the telephone

  Quick access to an automated attendant can speed the hospital checking-in process.

Improve Response in a Busy Urban Environment

Mid-sized hospitals deal with a high percentage of emergencies, both in the hospital and in the outside community. Hospitals can improve their patient services and emergency response by:

- Mobilizing staff during disasters or emergencies outside the hospital
- Improving response to emergencies inside the hospital
- Improving emergency room response for the many critical cases arriving by ambulance

DEFINITY ECS products can provide the following services to hospitals:

- The INTUITY CONVERSANT Voice Information System provides emergency outcalling. The system calls a predefined emergency response staff. Upon receiving the call or page, the staff members can call into a voice mailbox to receive specific instructions for the emergency situation.
- Paging systems provide an effective way to broadcast emergency situations throughout an entire department or facility. Visual paging ensures that the hearing-impaired are also notified of emergencies.
- TransTalk mobile telephones help nurses stay in touch with doctors and technical experts while carrying out their duties.

DEFINITY ECS helps hospitals improve emergency services without adding staff.

Maximize Productivity and Efficiency

Many healthcare facilities participate in an integrated health network consisting of numerous hospitals, clinics, doctors, offices, laboratories, and other medical facilities. Although they are often autonomously managed, these multiple sites have to function as a single organization to keep costs down and enable the facilities to be financially successful.

Staff of integrated health networks includes administrators, nurses, technicians, physicians, and support personnel. Many members of the staff are active multiple shifts, and are seldom confined to an office.

Healthcare facilities need to be able to:

- Manage multiple sites as if they were one
- Maintain close communication links between widely-operated facilities, and include related organizations such as suppliers and clinics
- Reduce unnecessary overhead paging
- Improve response to emergencies
- Provide an efficient way to communicate non-emergency information to busy mobile staff

DEFINITY ECS products can help healthcare facilities maintain productivity and efficiency with the following products and features:

- Standardized DEFINITY ECS systems, networked for feature transparency with four-digit dialing between locations, can ensure that staff wastes no time adapting to the communications system as they go from location to location.
- Voice Messaging systems, networked together, can reduce personal paging and eliminate telephone tag when staff must continuously leave messages and wait for returned calls.
- DEFINITY call center packages can support the facility's busiest offices, such as: business office, hotline groups, clinics, and admissions offices.
- Lucent Technologies Call Accounting System for Windows® allows healthcare facilities to chargeback telephone equipment and usage to doctors, clinics, and offices.
- Lucent Technologies offers an array of wireless solutions that provide an effective way to communicate with nurses, doctors and others who must be mobile.
- Outside labs, pharmacies, physicians' practices, vendors, and other organizations who frequently deal with the healthcare facility can obtain guest mailboxes on the voice messaging system. The healthcare institutions can thus avoid toll charges that should be paid by others.

By using Lucent Technologies products, healthcare facilities can reap the following benefits:

- Improved communication between staff members in different locations
- Simplified administration of dispersed systems
- Better response to true emergencies
- Improved staff efficiency and satisfaction

Provide Highly Efficient Phone Service

Many healthcare facilities encounter problems responding to the large number of incoming calls to their busiest offices. Callers are frequently put on hold for long periods of time before representatives are available to help them.

Healthcare facilities need to:

- Eliminate the frustration experienced by callers and consequent negative perceptions of the facility
- Improve the quality of service, without increasing costs
- Optimize staffing by using the staff for what they were trained

DEFINITY ECS products can provide the following capabilities to the healthcare industry:

- Critical reliability system configurations, which ensure that the system is fully operational more than 99 percent of the time.
- The INTUITY CONVERSANT System gives callers access to basic information 24 hours a day, seven days a week.

  For example, callers can find out the balance owed or get a copy of their bill — without speaking to an agent.
- DEFINITY Communications System with call center provides Expert Agent Selection (EAS) with Call Prompting, which enables calls to be routed appropriately.

  Medicare claims, for example, can be routed to the assigned agent based on caller input. Agents are happier because they are spending more time helping callers in their areas of expertise.

  Call Vectoring in conjunction with INTUITY CONVERSANT enables callers to check their account information with the hospital's mainframe system while waiting to speak to an agent. If they still need to speak to a representative, they do not lose their place in line. Callers can also be given the anticipated wait time before reaching an agent, and be offered the option of leaving a message for a later callback.

- PassageWay™ products allow a caller's record to appear on the agent's screen as the call rings on the phone, based on caller input or Calling Line (or number) Identification. This eliminates the need for the agent to ask identifying questions and locate the records more easily. It also improves service by enabling the agent to greet the caller by name and begin to address the issues more quickly.

  The business office can also make payment inquiries to the insurance carrier or patient during idle periods via a worklist that is downloaded from the hospital database and designed for preview dialing. This allows the agent to quickly review the insurance record and initiate the call from their computer with a mouse click.

- CentreVu Call Management System allows the business office supervisor to assign the appropriate number of representatives and analyze call volume to identify opportunities for improvement. The system can also be used by the supervisor to determine if representatives are responding in a timely way to callers.

By using Lucent Technologies products, healthcare facilities can provide more efficient phone service and in return, reap the following benefits:

- Faster response to callers
- Accurate staffing
- More personal service
- Higher productivity
- Improved image of the healthcare facility

Promote Wellness and Satisfaction with Easy Access to Information within the Community

Healthcare facilities gauge the satisfaction level of their services from patients and community as a measure of their success. Facilities need to provide the best "first impression" of the hospital. In most cases, it's in the best interest of the healthcare provider and insurer to promote wellness in order to keep hospitalization costs down.

Healthcare facilities need to:

- Provide easy access to wellness information
- Educate the public about preventative measures
- Encourage the public to take control of their health issues in a timely manner
- Provide referrals for healthcare professionals and specialists

DEFINITY ECS offers an easy way to help the healthcare industry:

- INTUITY CONVERSANT enables a health information hotline, which is an audio library of health tips and procedures. This allows patients to help themselves. It can separate calls into groups of those who need care immediately, those who need to be scheduled with a physician, and those who simply need basic information, such as the remedy for a bee sting.
- DEFINITY AUDIX allows callers to leave non-emergency questions or messages for later callbacks, so that callers can get personal attention.
- INTUITY CONVERSANT allows healthcare facilities to provide physician referrals, schedule appointments on the spot, or to provide basic health information via voice or fax.

Lucent Technologies products help healthcare facilities to provide first-rate personal care in a cost-efficient manner.

Improve Accessibility to Specialists

Medical professionals often need to contact specialists in a particular field, but are restricted because of time, distance, and expense. They provide better medical care by:

- Consulting with experts, sometimes during surgery
- Overcoming boundaries of distance — by consulting with any physician, no matter where they are located

Lucent Technologies provides healthcare with the ability to send video from a remote site to specialists, without waiting for postal delays. Group Video and Desktop Conferencing systems provide the following benefits:

- Extend expertise
- Improve patient care
- Foster collaboration
- Teach new skills
- Save travel time and expense

Using a video camera, physicians can transmit high-quality images during surgery over a phone line to colleagues at advanced medical centers while the operation is still underway. The professionals can exchange images and confer over the same phone line. The process is as easy to orchestrate as a regular phone call.

Physicians can also use the video systems regularly for rapid exchange of images between research teams and colleagues. Patients in rural areas can be screened, and video can be examined across a long distance, all during the time of an office visit at the remote setting.

Desktop conferencing systems can be used in patients' homes by home health nurses to confer with physicians about patient conditions. This enables more patients to be cared for outside the hospital, and reduces the need for the very ill to travel to the hospital or physician's office.

Maintain Skills and Collaborative Relationships Regardless of Location

In the Healthcare industry, there is an urgent need for multiple sites to operate as one and for medical professionals to collaborate remotely, so they can provide top quality health care to patients in rural areas. Doctors and nurses must also stay abreast of technological innovations in the field and continue their educations.

DEFINITY ECS can play a critical role in connecting remote and sparsely populated communities with the advanced centers in healthcare. This technology enables the same level of sophistication in the rural settings as that available in the urban medical centers by:

- Improving communications
- Improving staff satisfaction
- Increasing personnel skills
- Providing improved patient care
- Reducing time and expense of travel

The Lucent Technologies desktop conferencing System can help with:

- Continuing medical education.

  Doctors can learn at their desktops, without having to pay for expensive travel bills and time away from their office and home.

  Medical students can be educated at remote sites. Distance learning can help medical students assigned to rural clinics learn from doctors in hub hospitals and medical centers.

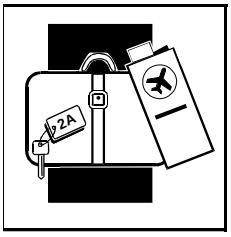
- Virtual consultation.

  Patients can talk to physicians, and primary care providers can talk to specialists using Group Video or Desktop Conferencing Systems. Instead of bringing patients in outlying areas to the hub hospital, doctors can conduct virtual meetings with the ability to share charts and images from electrocardiograms, magnetic resonance imaging, cardiotomagraphy scans, bone density scans, and other visual diagnostic tools by using the document camera or other medical peripherals. (Note: this should be used for consultation only; it should not be considered diagnostic by itself.)

- Remote consultations by non-physician medical staff, which are often difficult to arrange in rural areas.

  Nutritionists, for example, are particularly scarce in remote settings. A nutritionist can use video to communicate with a patient in a distant facility, showing food models of healthy portions and being face-to-face with the patient for better understanding.

Hospitality



The hospitality industry is composed primarily of hotels, motels, and restaurants.
Hospitality facilities worldwide seek to:

— Control costs

— Improve operating efficiency and safety

— Enhance guest services

Control Costs

Hospitality providers must contain costs in order to maintain a profit and stay competitive in the industry.

Two ways to help control costs are as follows:

- Separate long-distance calling privileges

  Hotel and motel guests frequently place long-distance phone calls from their rooms, while providers disallow staff members from accessing long-distance phone service.

- Charge guests more accurately for terminated calls

  Hospitality providers need the ability to detect short duration calls (that is, calls that terminate before the specified answer detection time-out), enabling hotels to more accurately charge guests for these calls.

DEFINITY products can provide the following capabilities to the hospitality industry to help control costs:

- World Class Routing features, which allows hotels to separate long-distance calling privileges for guests and administrative staff.
- An Answer Detection feature that enhances the DEFINITY system's ability to detect short duration calls.

Improve Operating Efficiency and Safety

Hospitality service facilities continuously deal with fluctuating economies, and must maintain maximum efficiency to ensure smooth operations and productive employees.

Three ways hotels can improve operating efficiency and safety are as follows:

- Simplify guest billing for phone expenses

  Hotels and motels need simplified guest billing, along with the ability to generate guest phone records

- Powerful voice-messaging service

  Guests and administrative staff need to be able to leave voicemail or faxes for other guests and staff members. Guests can have callers leave messages or faxes for them privately, without having to involve the front desk.

- If a guest makes an emergency call, the system automatically notifies the desk attendant, identifying the room that placed the call.

DEFINITY products can provide the following capabilities to the hospitality industry to maintain maximum operating efficiency:

- The Call Detail Recording feature works in combination with system adjuncts to generate guest records and call costs records.
- INTUITY Lodging™ allows guests and the administrative staff to create, store, send, and receive voice or fax messages. Spoken prompts guide the user through each step of the procedure. The system can be administered for a variety of languages.

Enhance Guest Services

Hospitality providers must constantly find ways to enhance guest services. Staff must work hard to make guests feel comfortable, and to maintain and uphold a reputation for outstanding service. Today's harried consumers want to get top-quality service for their hard-earned income.

Hotels can enhance guest services as follows:

- Review guest requests for services

  Hotels and motels need a way to review guest requests and ensure that guest's needs and requests are met in an efficient manner by the staff.

- Connect to internal computer systems

  Staff can provide better customer service by linking the telephone system to the hotel's internal computer system for registration information and voice messaging features.

- Provide phones with modem hookups and conference call capabilities.
- Provide voice and fax messaging services.

DEFINITY products can provide the following capabilities to the hospitality industry to enhance guest services:

- Guest activity reports containing information on items such as requests for wakeup calls and delivery of these calls can be printed in hard-copy form or can be viewed at the Administration terminal. These reports help the administrative staff to ensure that guest requests for services are not overlooked, and that guests get prompt and efficient service from the staff.
- Having Group Video systems on hand allows guests to conduct planned or even impromptu video conferences.
- A PassageWay solution at the front desk can allow a hotel concierge to put guest information on screen instantly when the guest or an outside caller calls.
- INTUITY Lodging allows guests and the administrative staff to create, store, send, and receive voice or fax messages. Spoken prompts guide the user through each step of the procedure. The system can be administered for a variety of languages.

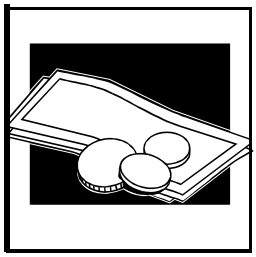
Specialized DEFINITY ECS Solutions

DEFINITY ECS can also provide the following features for hospitality services:

- Integration of voice/fax messaging with property management systems
- Automatic Wakeup
- Do Not Disturb
- Emergency Access to the Attendant
- Mixed Numbering
- Names Registration
- Maid Status

For more information about hospitality solutions, please see Chapter 5, "Hospitality Solutions".

Financial Services



The financial services industry may include banking institutions, credit unions, insurance companies, mutual funds companies, and brokerage firms. These types of businesses are nearly indistinguishable from one another in some areas. Deregulation, technological advances and strong competition induce each to offer a broad range of financial services. Many of these services are automated in order to improve customer service and make the most of available resources.

Financial service providers worldwide seek to:

- Control costs
- Automate routine transactions
- Network regional and global offices
- Upgrade customer service

Control Costs

Cost savings are inherent in many DEFINITY ECS solutions. Using an automated attendant in place of an employee to answer routine calls reduces payroll expenses, for example, and using the system to share account information between widely separated offices eliminates the need for redundant software. Beyond the day-to-day savings that automation and networking provide, however, DEFINITY ECS includes some capabilities that directly affect your operating costs.

Tenant Partitioning

Often you can recover the initial and ongoing costs of the DEFINITY ECS itself by investing in a DEFINITY ECS configuration that can handle both your own needs and the needs of the tenants in your building. The system allows you to assign partitions within the system, giving each tenant the privacy and security of an individual communications server. In this way small tenants can take advantage of the advanced features of a large system that they would not normally be able to afford. Extra space in your building is more easily let, and you have a continuing source of revenue. As your business grows, you can replace tenants with employees on the system and in the building.

Automate Routine Transactions

In many countries, as much as a quarter of all bank transactions are conducted by telephone. For related businesses such as brokerage houses, the percentage can be much higher. Typically, at least half of these calls are from callers requesting routine information. The INTUITY CONVERSANT System allows you to set up an automated attendant that screens calls for your busy customer service representatives. For example, the attendant may handle incoming calls by offering the following options to the caller:

- For business hours, press 1.
- For interest rates, press 2.
- To receive a loan application, press 3.
- To speak to a customer service representative, press 0.
- Or simply enter the extension of the person you are trying to reach.

For the calls channeled to your customer service representatives, DEFINITY ECS's Automatic Call Distribution holds overflow calls in queue for the next available representative. It generates reports that identify peak calling periods, how much time representatives are spending on calls, and which lines are being used. This allows you to maintain high quality customer service while adjusting the size and working hours of your staff.

A real advantage of the INTUITY CONVERSANT system is that it allows your customers to bank 24 hours a day. With additional CONVERSANT software, your customers can:

- Inquire about their accounts and get balances
- Transfer funds from one account or investment to another
- Identify checks that have cleared or transactions that have been made
- Stop a transaction or payment on a check
- Pay fees or bills

Network Regional and Global Offices

If your company has offices scattered throughout different regions or countries, it's probably important to you that your procedures are the same everywhere. Your customers probably expect consistent service wherever they go and however they choose to interact with your firm. Networking the offices together is an obvious solution, because it also allows the offices to share information. To accommodate this, your system must be flexible enough to accommodate a variety of requirements and equipment.

Q-SIG Global Networking

Lucent Technologies has been a leader in providing equipment compatible with Q-SIG, a global standard for vendor-independent networking. Q-SIG has been adopted by the International Standardization Organization, ensuring its acceptance worldwide. Lucent's Q-SIG Global Networking allows you to network different types of systems throughout the world. If, for example, you have acquired an office in another country that uses non-Lucent equipment, Q-SIG Global Networking allows you to incorporate that equipment into a DEFINITY ECS network. The systems can work seamlessly together, through shared features, flexible numbering plans and simplified network operations and management.

Call Center

Once your offices are networked together, you can set up a call center hub at one office so that your incoming calls are handled consistently and efficiently. Here's how you might set up your call center:

1. DEFINITY ECS's Automatic Call Distribution routes the calls to your hub office.
2. The system identifies the country from where the call originated.
3. In the caller's native language (English, Parisian French, German, or Castilian Spanish — other languages available soon), a CONVERSANT system asks the caller for his or her account number and type of transaction desired.
4. The call is routed to an agent who speaks the caller's language.
5. The CallVisor ASAI provides the agent with the caller's account information on the agent's console screen.

If the customer requires special attention, the Expert Agent Selection feature sends the caller to the appropriate agent. For example, a customer from France seeking information on investment opportunities is routed to a French-speaking financial planner.

There are a few ways to accommodate those who are calling from rotary telephones. The simplest way is to send the caller to an agent for personal attention if the caller does not enter information immediately after being prompted by the automated attendant. If this solution is impractical, you can distribute inexpensive touch-tone devices to your rotary-phone customers. If those customers speak UK English, Parisian French, German, or Castilian Spanish, you can even use CONVERSANT's Automatic Speech Recognition, prompting the callers to choose various options. (This will soon be available for other languages. Check with your local distributor.)

Group Video Systems

A final aspect of standardizing your customer service is training. Some banks have set up Group Video Systems at their branches and a MultiPoint Control Unit at the home office. This allows full-motion, real-time interactive video calls among them. All the branches in the network can watch and participate in training sessions.

The MultiPoint Control Unit works in several modes:

- Voice Activated Switching — All locations see the person speaking and the person speaking sees the person who spoke before.
- Presentation — All locations see the presenter, and when questions are asked, all hear the questions but continue to see the presenter.
- Broadcast Autoscan — All locations see the presenter, and the presenter can scan locations at intervals.

Improve Customer Service

Improved customer service is inherent in many DEFINITY ECS solutions. Using an INTUITY CONVERSANT system to answer and screen calls reduces the time customers wait in a calling queue, for example, and using video systems for training ensures uniform, quality service. Beyond these indirect improvements, however, the system includes some capabilities that directly upgrade your customer service.

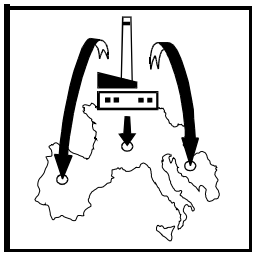
Lucent Technologies's call center technology allows you to set measurable customer service goals. You can monitor calls to help ensure that abandoned calls are eliminated or reduced. The Average Rolling Speed of Answer feature ensures that customer calls are handled promptly. The reports generated by the CentreVu Call Management System can help you evaluate agent's productivity. Using these reports, you can also plan staffing levels to meet demand as needed. CentreVu Report Designer allows you to create customized graphic reports for the specific needs of your call center.

Lucent Technologies's CentreVu Supervisor allows managers to generate reports by exporting data to common spreadsheet programs. You can even leave this application running in the background on your computer, and it will alert you when crucial thresholds have been exceeded.

Here are some additional ways DEFINITY ECS can help you serve your customers:

- INTUITY CONVERSANT brokerage applications allow your brokerage customers who use car telephones to access account information by speaking rather than pressing keys.
- Expected Wait Time tells callers how long they can expect to wait in queue, and offers transactions options according to how long they will be waiting.
- The system can also be set up to provide callers with investment and loan information related to their portfolios while they are waiting in queue.
- DEFINITY ECS's open architecture allows you to easily change and modify features to meet the changing needs of your customers. For example, setting up a telemarketing center often requires making only minor modifications to your DEFINITY ECS call center.
- Some global organizations have calls received after business hours relayed to an office still open for business in another part of the world. This saves the cost of round-the-clock staff and keeps your customers in touch with your best agents.

Wholesale Distribution



The wholesale distribution industry includes both merchants and agents. Merchants buy and sell merchandise, while agents limit themselves to presenting the merchandise and negotiating its sale. Some wholesale distribution companies serve both functions, depending on the circumstances. Most wholesale distribution companies are relatively small, and face increasing competition from larger firms and even from manufacturers themselves. Therefore, most wholesalers cannot easily raise the prices of their products. Continued success requires that they reduce costs and offer more services to both suppliers and customers.

Wholesale Distributors worldwide seek to:

- Provide convenient access to product information
- Automate or streamline ordering procedures
- Provide retailer feedback to suppliers
- Automate routine tasks
- Network regional and global offices
- Upgrade customer service

Provide Convenient Access to Product Information

INTUITY AUDIX allows retailers to get product information at the touch of a button. For example, when a clothing retailer calls the wholesaler's product information number, AUDIX presents the caller with the following options:

- For information about women's clothing, press 1.
- For information about men's clothing, press 2.
- For information about children's and young adult's clothing, press 3.
- For information about shoes, press 4.
- To speak to a representative, press 5.
- Or simply enter the extension number of the person you are trying to reach.

The retailer has the option of listening to the product information or having it faxed automatically. You can also have AUDIX call customer service representatives to notify them when they receive voice messages from special customers.

Automate or Streamline Ordering Procedures

Many of the DEFINITY Call Center features that we have described for other industries apply equally to wholesale distribution. Just as in other applications, for example, the system can route calls based on the time of day or the number of calls in queue. This allows you to have calls received after business hours transferred to an office that's still open. You can also have calls transferred that have been waiting in queue too long.

The Expected Wait Time feature provides a reliable estimate of the time a caller will wait in queue before being connected to an agent. Based on that time, different choices are presented to the caller, such as remaining in queue, leaving a message for a later callback, or transferring to automated services (on INTUITY Conversant Applications). Callers are more comfortable waiting in queue when they know how long the wait will be and can choose alternate options.

The DEFINITY ECS offers a wide range of Call Center features which allow customers to order via fax, via automated voice messaging, or via expedited personal service with minimal waiting in queue.

Provide Retailer Feedback to Suppliers

Any of DEFINITY ECS's voice messaging products allow you to set up a voice mailbox for receiving comments from retailers. You can handle the information more elegantly by setting up an interactive survey using the CONVERSANT Voice Information system. For example, those calling a retailer's feedback hotline might be presented with the following options:

- To comment on an order, press 1.
- To comment on a product, press 2.

After making one of these selections, the caller is given additional options, such as:

- Was your order delivered when promised?
- Was your order complete?
- Was your order undamaged?

The system can be set up to tabulate the data and generate reports, which could be invaluable to suppliers. You can set up similar surveys to provide a variety of market information for suppliers — giving them information about the effectiveness of an advertising campaign, for example.

Call Center Solutions

3

DEFINITY Call Center applications are designed to efficiently connect each caller with the representative best suited to serve that caller. The DEFINITY ECS begins the process by capturing information about the caller even before the call is routed. That information is integrated with existing databases (see Chapter 4, "Computer-Telephone Integration Solutions") and the combined data is used to match caller to agent. Additional DEFINITY features politely keep callers waiting in queue (a holding place for incoming calls) informed about how long it will probably take to process the call. Detailed call statistics are constantly available to agents and supervisors.

Calls coming into your DEFINITY ECS call center are queued up and routed based on information that the system continually acquires. Each of your customers can be presented with a variety of options for leaving a voice message, leaving a fax, or monitoring the status of his or her call. Using CONVERSANT voice response software, the system can even respond appropriately to spoken information.

This section describes the DEFINITY ECS call-center capabilities:

- *Automatic Call Distribution*, which manages call traffic and work flow.
- *Call Vectoring*, which allows managers to create controlled routing scenarios that give each caller the best possible service at the least cost.
- *Look-Ahead Interflow*, which balances incoming call loads between two or more DEFINITY ECS systems.
- *Call Prompting*, which wallows you to handle incoming calls based on digits entered by the calling party.
- *Expert Agent Selection*, which matches the needs of your callers to the skills of your call center agents, ensuring the best possible service to the caller.

- *Voice Response Integration*, which combines and integrates the capabilities of your DEFINITY call center system with those of your CONVERSANT Voice Information System.
- *CallVisor ASAI*, which delivers call information to a host computer application which routes calls and supplies information to agents.
- *CentreVu Call Management System*, which provides reporting and management information about your call center.
- *CentreVu Supervisor*, which provides a MicroSoft® Windows™-based graphic interface for your CentreVu Call Management System.
- *Basic Call Management System*, which provides call management reporting for smaller call center operations.

DEFINITY ECS provides an applications platform that consists of several elements. When these elements are integrated to meet your business requirements, you will have the advanced call distribution and management capabilities that will deliver the performance and growth necessary for your business success.

NOTE:
Some applications and products are unavailable in some countries. Please check with your local distributor for further information about which features and applications are available to you.

Automatic Call Distribution (ACD)

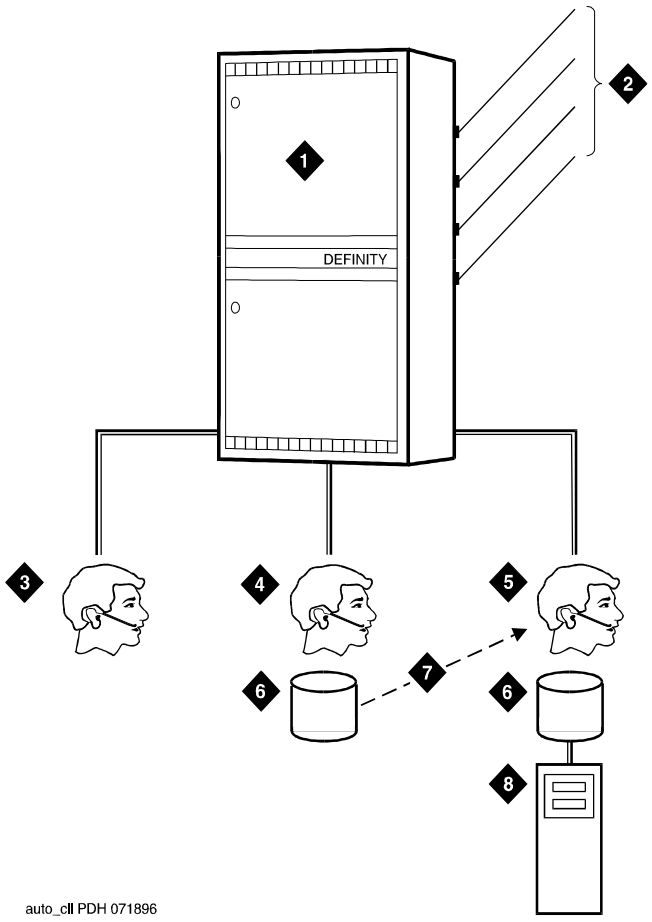
If your company has departments (such as sales, billing, or customer service) that handle large volumes of incoming calls, you can benefit by using DEFINITY ECS's powerful ACD capabilities. ACD is the basic building block for call center applications.

ACD offers you a method for distributing incoming calls efficiently and equitably among available agents. With ACD, incoming calls can be directed to the first idle or most idle agent within a group of agents. With most idle agent distribution, an incoming call is routed to the agent who has been available for the longest time, resulting in balanced workloads for agents.

Agents in an ACD environment are assigned to a hunt group, a group of agents handling the same types of calls. DEFINITY ECS supports up to 600 different hunt groups. Each hunt group has associated trunks, stations, recordings, and queues. You can assign many ACD features on a per-hunt group basis to meet the different needs of diverse agent groups. You can link a telephone number to an ACD hunt group by associating a published number (often an 800 number) with the hunt group extension number of the hunt group.

Each DEFINITY ECS can support and measure up to 5,200 agents. The total number your system can support will depend on the system configuration, the number of hunt groups to which agents are assigned, and the version of CentreVu Call Management System you use.

In the Figure 3-1 example of a travel agency, Hunt Group A receives calls only when agents are available since it has no queue. Calls to Hunt Group B can be queued while agents are unavailable, and redirected to Hunt Group C if not answered within an administrable time. Calls to Hunt Group C are redirected to voice mail if not answered within an administrable time.



1) DEFINITY ECS
2) Incoming Lines
3) Group A: Business Travel
4) Group B: Personal Travel
5) Group C: General Information
6) Queues
7) Call Coverage to Group C
8) Voice Mail

Figure 3-1. A Basic Example of Automatic Call Distribution

DEFINITY ECS places all Automatic Call Distribution calls into a queue. Each call stays in the queue until an agent becomes available, until an optional timed interval expires, or until the caller hangs up. If the call has not been answered after an administrable period of time, an announcement can be played for queued callers. The call can then be connected to music to let the caller know that the call has not been dropped, it can be sent to a coverage path, or it can be connected to another announcement.

You can set a maximum queue length in a group to anywhere from 0 to 999 calls, and you can establish a queue warning level. If the preset maximum queue length is reached, additional incoming calls are redirected to a call-coverage path (if administered), ensuring that calls are routed to an extension that will answer the call or are given a busy signal. A priority-queuing feature allows you to designate which calls should receive priority; these calls override the standard first-in-first-out queuing pattern.

Two features provide for redirection of ACD hunt group calls:

- Intraflow allows an ACD call to be redirected from one hunt group to another through coverage paths that are assigned to determine call redirection criteria.
- Interflow allows new calls in a hunt group's queue to overflow and be sent to another ACD hunt group on another system using the Call Forwarding All Calls feature. Interflow can be useful during the evening, during peak operation times, or at other times when agents are unavailable.

ACD agents can use any DEFINITY ECS telephone. The CallMaster digital telephone, described in Chapter 10, "Desktop Solutions", is particularly recommended to meet the needs of ACD agents. A number of special ACD agent features can be assigned to agents' telephones to enable them to perform their jobs effectively. In addition, special features are available to assist supervisors in observing and monitoring the performance of agents.

Additional features give your company even more options when using ACD:

- Stroke Counts provide ACD agents with the ability to record up to nine definable events on a per-call basis by pressing a button when CentreVu Call Management System is active. A tenth event records audio difficulty. Forced Entry of Stroke Counts can be administered for every call answered in the Manual-In mode.
- Call Work Codes allow ACD agents to enter up to 16 digits while on an ACD call (or in After Call Work mode) to record the occurrence of definable events (such as account codes, social security numbers, or phone numbers). CentreVu Call Management System is required to record Call Work Code information. Forced Entry of Call Work Codes can be administered for every call answered in the Manual-In mode.
- Queue-Status uses button lamps and telephone displays to indicate call status for calls waiting in an ACD queue on telephones with a digital display. It can also display how long the oldest call has been waiting.

- Dialed-Number Identification Service allows agents to identify (via display telephones) the purpose of each incoming call and greet the caller appropriately.
- Automatic Available hunt group allows CONVERSANT Voice Information System or other “nonhuman” agent positions to be automatically staffed and made available.
- Each agent can be logged into as many as four hunt groups at a time.
- Malicious Call Trace allows you to designate stations that can trace emergency or threatening calls. When an agent receives a malicious call, the agent presses the Malicious Call Trace button. The system gathers trace information and connects a voice recorder to the call. All equipment used to complete the call is held up (the call cannot be disconnected) until the feature is deactivated.
- Redirection on No Answer allows an unanswered, ringing call to be redirected to an ACD queue or to a Vector Directory Number (see below) after an administered interval. The agent position will also be taken out of service.
- VuStats provides agents and supervisors with call management information on their telephone displays. This customized information can include how many calls an agent has taken and how many agents are on break, for example.
- Station Hunting allows calls to be routed first to the called extension, then according to a linear, circular, or modified circular sequence of extensions. The circular sequences work to distribute calls equitably, ensuring that there are no overworked “first” extensions in a hunt group.

Call Vectoring

Call Vectoring is a versatile method of routing incoming calls that can be combined with Automatic Call Distribution for maximum benefit and call center efficiency. A call vector is a series of call-processing steps (such as providing ringing tones, busy tones, music, announcements, and queuing the call to an Automatic Call Distribution hunt group) that define how calls are handled and routed. The steps, called vector commands, determine the type of processing that specific calls will receive.

Vector commands may direct calls to on-premises or off-premises destinations, to any skill or hunt group, or to a specific call treatment such as an announcement, forced disconnect, forced busy, or music.

With combinations of different vector commands, incoming callers can be treated differently depending on the time or day of the call, the expected wait time, the importance of the call, or other criteria. DEFINITY ECS can route incoming callers to up to 512 different vectors. Each vector can have up to 32 commands. DEFINITY ECS also allows vectors to be linked via the “Go to Vector” command.

Vector Directory Numbers and Vectors

Calls access DEFINITY ECS vectors using vector directory numbers (Vector Directory Numbers). A Vector Directory Number is a “soft” extension number that is not assigned to a physical equipment location. A Vector Directory Number has several properties that are administered by the system manager and that include the extension number, Vector Directory Number name, class of restriction, display override, and the vector number associated with the Vector Directory Number.

Access to a Vector Directory Number may occur in many ways. Since a Vector Directory Number is an extension, it can be accessed in almost any way that an extension can be accessed.

Each Vector Directory Number maps to one vector. However, several Vector Directory Numbers may map to the same vector.

When answering a call, the answering agent will see the information (such as the name) associated with the Vector Directory Number on their display and can respond to the call with knowledge of the dialed number. This operation provides Dialed-Number Identification Service, allowing the agent to identify the purpose of the incoming call.

Applications

There are many different applications for Call Vectoring. However, Call Vectoring is used primarily to handle the call activity of Automatic Call Distribution hunt groups. Call Vectoring can also manage a queue by keeping calls queued in up to three hunt groups (with four different priority levels) while also providing a series of other processing options. Other common applications include:

Special Treatment for Selected Callers

For example, calls from preferred credit card customers may receive priority treatment, but they do not have to be handled by a separate hunt group. Agents in the same hunt group can handle both preferred customers and all other customers. Calls to different Vector Directory Numbers (and vectors) can queue to different priority levels, with preferred customers having top priority. This means that when all agents are busy in this hunt group, calls from preferred customers would go to the top of the queue ahead of other callers already in the queue.

Night Treatment

During non-business hours, the call vector could route calls to a specified destination such as an announcement and then disconnect the call. During business hours, the vector could queue calls to hunt groups for connections with agents. All of this can be accomplished automatically without any intervention by the hunt group supervisor.

Off-loading of Periodic Excess Calls

A vector can check conditions in the targeted hunt group, such as the number of calls already in queue. If the number is above a certain threshold, the vector bypasses that hunt group and routes the call to another hunt group or the vector can return a busy signal. However, if the number is below the threshold, the vector queues the call to that hunt group.

Information Announcements for the Calling Party

The human intervention needed to distribute common messages can be minimized with information announcements. People with a common interest can be instructed to call a specific number (a Vector Directory Number) that connects to a specific announcement vector, which routes callers to a voice messaging system or to an integrated announcement circuit pack in the system.

Look-Ahead Interflow

Look-Ahead Interflow allows two DEFINITY systems equipped with Automatic Call Distribution, Call Vectoring, and interconnected Integrated Services Digital Network-Primary Rate Interface (ISDN-PRI) lines to exchange information on the D-channel. In this way the systems can predetermine whether the receiving system can handle a call diverted from the sending system. This feature allows your company to ensure serving your customers incoming calls within specified service levels, even when one of your call centers is experiencing increased call requests. For example, you could direct calls to your call center in London if your call center in Paris is experiencing heavy call requests or cannot satisfy incoming calls for some reason.

Look-Ahead Interflow enhances Call Vectoring interflow by ensuring that calls do not interflow to a backup system that cannot satisfy expected service levels.

A Look-Ahead Interflow call is attempted when a route to number command successfully accesses an ISDN-PRI trunk group. A vector on the receiving system then either accepts or denies the Look-Ahead Interflow call attempt based on some condition, usually an Expected Wait Time threshold. The sending system does not relinquish control of the call until it is accepted by the receiving system. Until the call is accepted, the caller continues to hear any audio (such as ringback or music) applied by the sending system, and the call remains in any sending system queues. If the call is accepted, the call is removed from any queues at the sending system, and control of the call is passed to the receiving system.

If the call is denied, vector processing simply continues at the sending system. Audible feedback and the call's position in any queues at the sending system remain unaltered so the caller is unaware that a Look-Ahead Interflow call attempt has been made. The call vector may then apply alternate treatment, which may include placing another Look-Ahead Interflow call to an alternate backup system.

Look-Ahead Interflow is available on private network ISDN-PRI or Software Defined Network connections.

Call Prompting

Call Prompting, an integrated subset of Call Vectoring, may be used in various applications to enhance call handling based on information collected from the calling party. Call Prompting uses Call Vector commands to route calls based on the information collected. It allows you to solicit and provide information to incoming callers who are in queue without causing them to lose their place in queue. Four applications are described below.

- Automated attendant — Allows the calling party to enter the number of any extension on the system. The call is then routed to the extension. This allows you to reduce cost by reducing the need for live attendants.
- DIVA (data in/voice answer) — Allows the calling party to hear selected announcements based on the digits that he or she enters. This may be used for applications such as an audio bulletin board.
- Data collection — Allows the calling party to enter data that can then be used by a host computer application to assist in call handling. For example, this data may be the calling party's account number, which could be used to support an inquiry/response application.
- Call center messaging — Gives the calling party the option of leaving a message or waiting in queue for an agent. This may be used for an on-line order entry system or to further automate an incoming-call center operation.

Expert Agent Selection

Expert Agent Selection provides a method for your call center managers to match the needs of your callers to the skills/talents of your agents, ensuring the best possible service to the caller. Expert Agent Selection allows certain skill types to be assigned to a call type or Vector Directory Number. Routing incoming calls through a Vector Directory Number then allows the system administrator to direct calls to agents who have the particular agent skills required to fulfil the caller's needs successfully.

Caller needs can be identified by several methods. For example, information may be passed from the network in Dialed-Number Identification Service digits or Integrated System Digital Network messages, by call prompting digits or digits entered at a Voice Response Unit, or by using CallVisor Adjunct Switch Applications Interface to access a host database. Expert Agent Selection then uses each of the following capabilities to fulfill the caller's needs.

Call Distribution Based on Skill

Calls that require certain agent skills (such as “speaks Spanish” or “knowledgeable about Product X”) can be matched to an agent who matches the required skill. You can assign one of up to 600 skill numbers to each need or group of needs. The skills are administered and associated for each of the following:

- Vector Directory Numbers
- Agent Login IDs
- Callers

This refined skill definition capability allows you to organize call handling based on customer, product, and language, for example.

You can assign agents up to four skills or sets of skills. Examples of agents’ skills are: speaks Spanish, knows about Product X, can handle complaint calls, or has access to a particular database. Each of the agent’s skills are rated on a scale of 1-16. The ACD software distributes any call waiting for one of the agent’s Level 1 skills when the agent becomes available. If no calls are waiting for a Level 1 skill, the queued calls for Level 2 skills are distributed to the agent, and so on. Optionally, agents can take the highest priority, oldest call in queue, ignoring the skill levels.

Up to three different skills can be administered to a Vector Directory Number in a prioritized manner. The first or primary skill administered to a Vector Directory Number would be the skill that is required or desired to service a call to that Vector Directory Number. The second and third skills are optionally administered to a Vector Directory Number and represent other skills that are allowed to handle calls to that Vector Directory Number.

Logical Agent

Logical Agent associates an agent’s login ID with a particular telephone only when that agent is logged into a particular terminal.

The DEFINITY ECS treats agent login IDs as extension numbers. It identifies agents based on their individual login IDs. Thus, each agent is no longer associated with a particular telephone. Agents can use any console and multiple agents can use the same console on different shifts.

Agents use a single set of agent work mode buttons for all their skills. Work mode buttons no longer have particular hunt groups (or skills) assigned to them. Any telephone with work mode buttons can be used by any agent.

In addition to skills, the following capabilities are associated with agents’ login IDs.

- *Calls* — calls to the agent login ID reach the agent independent of the telephone the agent is using.

- *Name* — calls to or from the agent display the name associated with the agent login ID and not the name associated with the telephone.
- *Coverage* — when the agent is logged out, busy or does not answer, calls to the login ID go to the coverage path associated with the agent and not to the coverage path associated with the telephone.
- *Restrictions* — calls to the login ID or from the agent use the restrictions associated with the agent and not the telephone.

Each console is fully functional even when an agent is not logged in. The restrictions, coverage, and name revert to the telephone administration when the agent logs out.

Direct Agent Calling

Direct Agent Calling allows calls to be placed or transferred to an agent and have the call treated as an ACD call. Direct Agent calls can be originated by stations or trunks (with the proper Class of Restriction). If the originator or receiver does not have the proper Class of Restriction, the call is treated as a normal non-ACD (personal) call.

Reason Codes

Reason Codes allow agents to specify the reason for going to Auxiliary Work mode or logging out. Codes can be assigned to any reason: taking a break, meeting, training, lunch, or handling mail, for example.

Voice Response Integration

Voice Response Integration combines call vectoring capabilities with the capabilities of voice response units, particularly the CONVERSANT Voice Information System. Voice Response Integration can do the following things:

- Execute a CONVERSANT script while retaining control of the call in DEFINITY vector processing
- Execute a CONVERSANT script while the call remains in the hunt group queue and retains its position in the queue
- Pool CONVERSANT ports for multiple application
- Use CONVERSANT as a flexible external announcement device
- Pass data between DEFINITY and CONVERSANT
- Tandem Voice Response Unit data through DEFINITY to an Adjunct Switch Applications Interface host

These capabilities are provided by the converse command, which is an enhancement to basic call vectoring. The integration of Voice Response Units with vector processing provides the following advantages:

- Access to local and host databases
- Validation of caller information
- Text to speech capabilities
- Speech recognition
- Increased recorded announcement capacity
- Audiotext applications
- Interactive Voice Response applications
- Transaction processing applications

One of the advantages of Voice Response Integration is that it allows your callers to make more productive use of queuing time. For example, while a call is waiting in queue, the caller can listen to product information by completing an interactive voice response transaction. In some cases, it may even be possible to resolve the customer's questions while the call is in queue. This can help reduce the workload of agents during peak intervals.

If your caller was previously queued to an ACD hunt group, position in queue will be maintained during the execution of a CONVERSANT script. If an agent on the DEFINITY system becomes available to service the call, the line to the CONVERSANT Voice Information System is immediately dropped, and the calling party is connected to the available agent.

CallVisor Adjunct Switch Application Interface

CallVisor Adjunct Switch Application Interface (ASAI) enhances ACD by providing improved call automation. This improves agent efficiency and tracking. Data-screen delivery can be automated. The system provides an interface between the DEFINITY ECS and host computer applications. This two-way link lets the host system determine who should get incoming calls and control the routing of calls.

Home Agent/DEFINITY Extender

Two products, Home Agent and DEFINITY Extender, allow your agents to work from home. With DEFINITY Extender, agents can use display consoles from home and work exactly as they would in an office. Home Agent offers a similar solution that enhances the capabilites of analog telephones. See Chapter 7, "Telecommuting Solutions", for more information.

CentreVu Call Management System

The CentreVu Call Management System collects call traffic data, formats management reports, and provides an administration interface for Automatic Call Distribution on your DEFINITY ECS. It helps you manage the people, traffic load, and equipment in an ACD environment by answering such questions as:

- How many calls are we handling?
- How many callers abandon their calls before talking with an agent?
- Are all agents handling a fair share of the calling load?
- Are our lines busy often enough to warrant adding additional ones?
- How has traffic changed in a given ACD hunt group over the past year?

The CentreVu Call Management System operates on a Sun Sparcserver 5 or 20 computer in conjunction with DEFINITY ECS. The DEFINITY ECS processor sends information relating to trunk calls, station calls, calls routed by call vectoring, queued calls, agent actions, etc. to the CentreVu Call Management System while call center activities are in progress. You can then generate real-time and historical reports.

Real-time reports are displayed on the screen and dynamically show the status of agents, agent groups, ACD queues, one group's performance compared to that of another group, one agent's performance compared to that of another agent, abandoned calls versus answered calls, etc.

The real-time information display can be updated every 3 to 30 seconds depending on the processor and environment being used. The system allows you to have multiple windows open and functioning simultaneously on a single terminal. Each window can be resized and repositioned on the screen. You can also scroll through the information in the window.

Historical reports summarize call data into intervals (15, 30, or 60 minutes), and by daily, weekly, or monthly totals. Historical data can be kept on-line at all times to satisfy a variety of management information needs. The historical reports help you know when to reorganize your ACD agent group structure, change staffing levels, reprogram your incoming call vectors, reallocate your incoming trunks, and redistribute your call-traffic loads. They can be scheduled to print automatically at intervals.

You can select how much and how long summary data is stored. Weekly and monthly summary data can be stored for up to ten years.

You can customize your reports using the standard reports as a starting point. For example, you can overwrite the headings in copies of standard reports. You can also create your own calculations. This flexibility enables you to report on aspects of the ACD activity unique to your organization.

In addition to standard reports, the CentreVu Call Management System has a comprehensive, optional forecasting system that can help you predict the number of ACD agents you will need at some future date. You can use archived CentreVu Call Management System data, add variable data, change and remove forecasting data, and capture data from a particular period in order to forecast staffing requirements.

CentreVu Supervisor

CentreVu Supervisor is a MicroSoft Windows-based graphic interface for the CentreVu Call Management System described above. Besides the convenience of managing calls from a personal computer, the primary advantages of CentreVu Supervisor are:

- Enhanced Reporting — The application provides many new ways to view data:
  - — Pie and bar charts
  - — Integrated reports that combine real-time and historical data
  - — Threshold limits on real-time reports
- Customized Reports — The Report Designer feature allows you to easily create your own reports.
- Graphical Interface — The familiar windows-type interface allows users to learn the application more quickly.
- Data Export — The application allows you to easily export data into other Windows applications.

The CentreVu Call Management System is a prerequisite for the CentreVu Supervisor software.

Basic Call Management System

The Basic Call Management System, an integrated, internal capability, is a cost-effective solution for small start-up call centers, for existing companies with minimum system-measuring/reporting requirements or as a back-up to the CentreVu Call Management System. The Basic Call Management System helps you fine tune your call-center operation by providing reports with the data necessary to measure your call center agents' performances.

This feature offers call management control and reporting at a low cost for call-centers of up to 2000 agents. The Basic Call Management System is ideal for companies that need call management features but do not require the same capacities available with the larger CentreVu Call Management System, which requires an adjunct processor.

The Basic Call Management System collects and processes DEFINITY ECS's ACD call data (up to seven days) within the system; an adjunct processor is not required to produce call management reports.

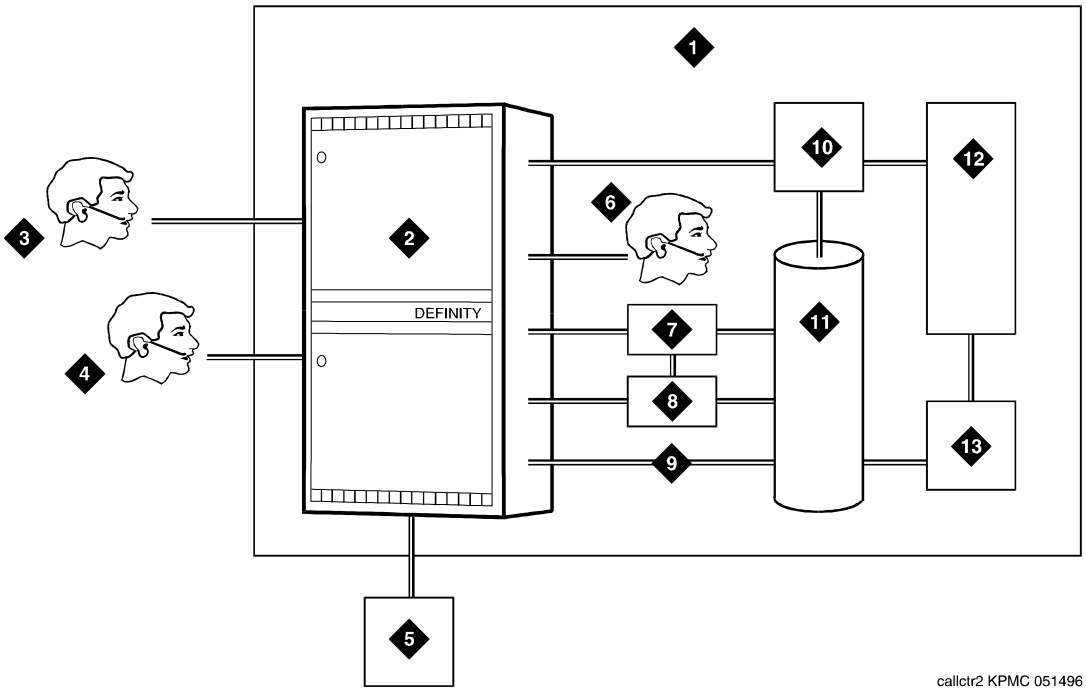
The Basic Call Management System provides various measurements for monitoring the operations of an ACD application. Basic Call Management System software organizes ACD calls and call-center measurements into functionally different reports that supply information useful for managing ACD facilities and personnel. The reports can be displayed on the system administration terminal in real time, printed immediately, or scheduled for printing at a later time via the Report Scheduler feature.

The following are the types of reports that can be generated:

- Real-time reports
  - Agent Status
  - System Status
  - Vector Directory Number Status
- Historical reports
  - Agent
  - Agent Summary
  - Split
  - Split Summary
  - Trunk Group
  - Vector Directory Number report

Call Center Summary

Figure 3-2 summarizes how you might set up a DEFINITY Call Center.



1) Your Office Building
2) DEFINITY ECS
3) Remote Agents Using DEFINITY Extender
4) Remote Agents Using Home Agent
5) Remote Call Center Using Look Ahead Interflow
6) Local Agents Organized By Skill
7) CentreVu Call Management System
8) CentreVu Supervisor
9) CallVisor Adjunct Switch Applications Interface
10) INTUITY Conversant Voice Response System
11) Local Area Network
12) Host Computer
13) Computer-Telephone Interface Server

Figure 3-2. A DEFINITY Call Center

Table 3-1 summarizes the four Call Center packages available with the DEFINITY ECS. These packages are available for all versions of the system. Specific configurations depend on the number of agents in the call center.

Table 3-1. Call Center Packages Available in the DEFINITY ECS

Feature	Call Center Basic	Call Center Plus	Call Center Deluxe	Call Center Elite
Automatic Call Distribution	X	X	X	X
Redirect On No Answer	X	X	X	X
Auto Available Split	X	X	X	X
Service Observing Basic	X	X	X	X
Service Observing Remote	X	X	X	X
MIA Across Skills/Splits and ACW Treatment Options	X	X	X	X
ACW in MIA List	X	X	X	X
Multiple Call Handling On Request	X	X	X	X
VuStats	X	X	X	X
Service Level	X	X	X	X
Login IDs	X	X	X	X
VuStats Enhancements	X	X	X	X
Move Agent/Change Skills While Staffed	X	X	X	X
Forced Multiple Call Handling	X	X	X	X
Multiple Announcement Boards	X	X	X	X
Basic Call Management System		X	X	X
Service Level		X	X	X
Login IDs		X	X	X
Timed After Call Work/Agent Pause Between Calls		X	X	X
Call Vectoring			X	X

Continued on next page

Table 3-1. Call Center Packages Available in the DEFINITY ECS — *Continued*

Feature	Call Center Basic	Call Center Plus	Call Center Deluxe	Call Center Elite
Call Prompting			X	X
Administrable Inter-digit Time-outs			X	X
Caller Information Forwarding[1]			X	X
Service Observe on Vector Directory Number			X	X
Vector Directory Number of Origin Announcement			X	X
Vector Directory Number Real Time Report			X	X
Call Work Codes			X	X
Redirect On No Answer To Vector Directory Number			X	X
Vector Initiated Service Observing			X	X
Enhanced Vector Administration			X	X
Route To With/Without Coverage			X	X
Vectoring Enhancements			X	X
Wildcard Matching			X	X
Multiple Audio/Music Sources			X	X
Vectoring Advanced Routing			X	X
ASA Routing			X	X
EWT Routing			X	X
VDN Calls Routing			X	X
Vectoring ANI/II Digits Routing			X	X
Expert Agent Selection				X
Increased Skills Capacities				X

Continued on next page

Table 3-1. Call Center Packages Available in the DEFINITY ECS — *Continued*

Feature	Call Center Basic	Call Center Plus	Call Center Deluxe	Call Center Elite
Add/Remove Skills by Feature Access Code				X
Service Observing on Logical Agent				X
MWL for Logical Agent Coverage				X
Inspect Button Shows Station Name				X
Reason Codes				X

1. Caller Information Forwarding is only available in the United States.

Computer-Telephone Integration is a fundamental component of efficient call center operations. Consequently, Chapter 4, "Computer-Telephone Integration Solutions" includes additional call center information.

Computer-Telephone Integration Solutions

4

Telecommunications and information systems are the fundamental building blocks of most businesses. Whether a sale is being made, a question being answered, or an order being placed, the telephone is the primary communications medium. And the information to make the sale, answer the question, or fulfill the order is stored in the computer.

If these two building blocks are closely integrated, your business will realize benefits that will redefine your standards for success and customer satisfaction. DEFINITY ECS integrates data processing, data communications, and voice communications.

The following Computer-Telephone Integration (CTI) products work with DEFINITY ECS to unite your computer and telephone in powerful ways:

- DEFINITY PC Console
- Callvisor Adjunct Switch Application Interface
- CallVisor computer-telephone integration products
- CallVisor Enhanced Services
- Several applications and products that make use of the CallVisor products
- PassageWay

NOTE:
Some applications and products are unavailable in some countries. Please check with your local distributor for further information about which features and applications are available to you.

DEFINITY PC Console

Lucent Technologies DEFINITY PC Console allows your call attendants to handle incoming calls efficiently by personal computer. Using the familiar Microsoft Windows graphical interface, the attendants can easily keep track of how long callers have been on hold and who they are waiting for. Attendants can monitor up to six calls at once. They need not fumble with pen and paper when handling calls, as they can make notes on their computers about what each caller needs. All this contributes to make a favorable first impression with your customers. Having the call processing software on the same computer with spreadsheet, word processing, or other software allows the attendants to stay productive between calls.

Your company directory is displayed on screen with busy extensions shaded. A variety of search functions are available, so attendants can find names and extensions easily. On-line photo identification allows attendants to quickly identify employees. Calls are transferred with the press of a button. On-line help makes it easy for attendants to remind themselves how to use the system.

The PC Console is easily customized, so even if attendants from different shifts share the same computer, they can each preserve their preferences in the call processing environment. The PC Console is available in English, Dutch, Spanish, French, German, and Portuguese. It will be available in Italian in the fall of 1997. If a Spanish-speaking attendant takes over for a French-speaking attendant, for example, a single press of a button converts all labels, error messages and on-line help to Spanish.

CallVisor Adjunct Switch Application Interface

The CallVisor Adjunct Switch Application Interface (ASAI), is an optional software package for the DEFINITY ECS, offers the productivity gains and customer service benefits of computer-telephone integration, including faster, more efficient call routing and handling. CallVisor ASAI establishes a built-in, two-way digital link for direct communication between your Switch and computing environment.

The CallVisor interface is based on International Telecommunications Union (ITU)-T standards for ISDN and on International Standards Organization (ISO) standards for data communications. This comprehensive and open applications-level interface provides access to and control of call-processing features via computer. DEFINITY ECS supports the interface on ISDN-BRI and TCP/IP connections as well.

AT&T developed CallVisor ASAI in cooperation with the 170-member ISDN/Digital Multiplexed Interface Users Group, an association of technology companies that promotes ISDN products and services. AT&T published the ASAI specifications in December 1989.

AT&T/Lucent Technologies has established development partnerships for ASAI with IBM, Hewlett-Packard, Dialogic, GIS, Tandem Computers, Stratus Computers, and Novell.

Lucent Technologies is offering ASAI to meet specific customer needs for integration applications. These applications include incoming and outgoing call management, customer service, and office automation. ASAI satisfies the following requirements for these applications:

- Simultaneous delivery of information about a customer to a call center agent's terminal with call delivery
- Set up, transfer, conference, and disconnect of calls controlled by a computer application rather than manually at a telephone
- Monitoring of calls arriving at particular extensions
- Routing of calls based on call information such as originating telephone number
- Controlling system features like "message waiting lamp"
- Agent login and out-of-call center groups through computers

Capabilities

CallVisor Adjunct Switch Application Interface. Defines eight application service elements that incorporate 48 separate capabilities provided by the DEFINITY ECS system. The particular elements that are used in your application will depend on the computer-telephone integration product with which the system is communicating.

First Party Call Control. Used when the application is a communicating endpoint in the call to be monitored or controlled. For example, the application might involve a program on one PC making a call to a program on a second PC. An application using First Party Call Control capabilities is limited to monitoring and controlling only calls that are directed to it. The application can still take advantage of some of the more advanced features of ISDN, however, such as delivery of the calling-party number.

Third Party Call Control. Allows the computer application to control call functions for other endpoints on the system. For example, an application can specify two endpoints for a call and then request that the system establish a connection between those two endpoints. The application here is not a true endpoint in the call; it has merely used an ASAI message to request that the system make the call and notify it when the call has been made. Once established, the application can control the specific communication functions required by the call.

Notification Application Service Element. Allows an application to request delivery of information about events occurring in a system, such as alerting a station by an incoming call, or connecting or disconnecting from the call.

Routing. Lets the system request routing information for a call from an application on the computer. The application provides a route or destination for the call on or not on the system. For example, when a call arrives, the system can request a route for the call based on the calling-party or called-party number information it passes to the computer. The computer can then send back an extension to which the call can be routed.

ISDN Advice of Charge. Integrates charging information, collected during and after outbound calls, with CTI applications. This information is useful for managing costs. When the cost of each call is visible to the customer service representative, the representative can work to shorten expensive calls.

Value Query. Requests information about the status or value of system objects or parameters. For example, an application can request the time of day, the status of call center agents and groups of agents, or information about the status of particular stations.

Set Value. Allows an application to change the status of system objects such as the message waiting indicator for a particular station.

Request Feature. Working with an application, can start and cancel Call Forwarding or Send All Calls, or log call center agents in and out and change their work modes.

Maintenance. Lets the system and computer send a message to show that the ASAI link is operating.

With CallVisor ASAI capabilities, an inbound call center application can perform a number of productive functions:

- Monitor calls and report on agent/split activity.
- Route calls based on Calling Line Identification and ACD activity such as the number of calls in queue and available agents.
- Prepare, deliver, and transfer the appropriate data screen to the agent along with the voice call; and copy the screen to the supervisor's terminal in response to an agent's request for help.
- Capture the telephone number of abandoned calls for later callback.
- Manage agent activity by automatically moving agents among splits based on calling volumes.

CallVisor ASAI also supports preview and predictive dialing in outbound call centers. Predictive Dialing ensures that call center agents only get answered calls. CallVisor ASAI uses DEFINITY hardware to obtain an analysis of call events such as whether a call has been answered or is busy.

CallVisor ASAI has a station-oriented mode of operation ideal for office automation applications. In this mode, the computer application acts as a surrogate end user, like a person with a telephone. The application can receive a

call when it comes into a station, manipulate the call while it is at the station, and invoke station features like lighting the message waiting light, setting Send All Calls, or Call Forward.

These capabilities could be used, for example, to provide an integrated voice and electronic mail system for office personnel. With this system, office personnel can have a message waiting light turned on whenever an electronic mail message is received or get an electronic mail message when a voice mail message arrives. Another application is a “Follow-me” call forwarding application, in which calls are automatically forwarded to different locations based on a schedule entered by the user.

The CallVisor ASAI capabilities and features can be used to support a variety of applications in the call center environment — as well as office automation applications that include directory services, message desks, and phone management. CallVisor ASAI-based applications let DEFINITY ECS and your computers share and use information, complementing and enhancing the communications and data-processing capabilities these systems deliver. These capabilities can help you streamline operations, improve productivity, and improve customer satisfaction.

Architecture

ASAI integrates the DEFINITY ECS with main-frames, minicomputers, personal computers (PCs), and distributed computing environments (such as LANs and client-server environments) for call center and office automation applications. In an inbound call center, agents use a telephone and a computer connected to a computing environment. The computer uses information it receives over the ASAI link to display information about incoming calls on the agent’s terminal.

In outbound call centers, the agents’ equipment is similar, but the computing environment uses the ASAI link to make outbound calls. ASAI also shifts agents from inbound to outbound service and back. It can be used to provide screen-based dialing and other office automation applications.

An ISDN primary rate interface (PRI) link provides calling-party and called-party information to the various applications. This link is not required, but it lets applications use network information provided by ISDN to broaden its scope. Without a PRI link, automated voice response units can still gather information needed by prompting with DNIS.

Application Programming Interface

ASAI provides an applications programming interface, which can be used by vendors to develop computer-telephone integration applications. The applications programming interface supplies the syntax and operation of the function calls used to invoke ASAI capabilities. The interface can be used to communicate with vendor-specific application interfaces. For example, IBM has an appli-

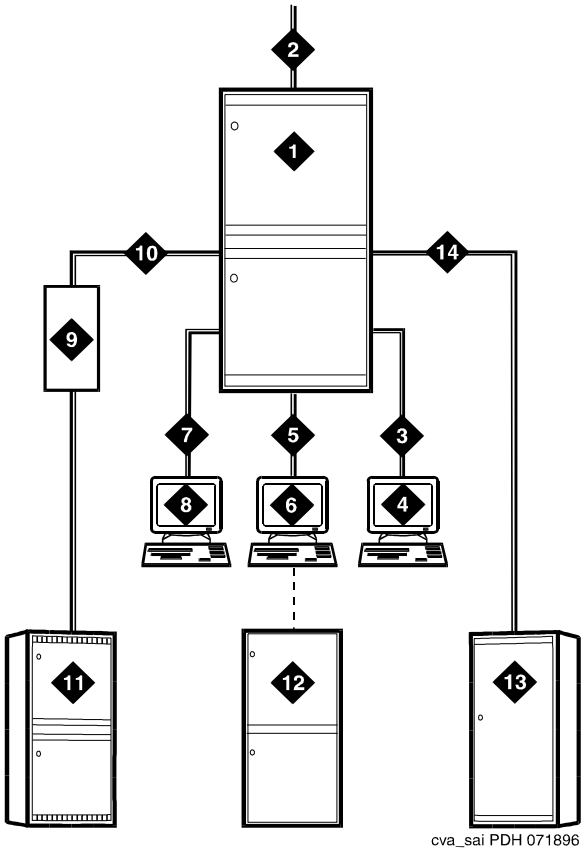
cation program interface known as CallPath' Services Architecture. Digital Equipment Corporation works with an application program DEFINITY ECS interface called Computer Integrated Telephony. Lucent Technologies CallVisor for UNIX can also be linked to ASAI.

CallVisor for UNIX

The Lucent Technologies CallVisor for UNIX provides an ASAI interface between a PC and your DEFINITY ECS. CallVisor for UNIX, also known as PC/ASAI is an excellent choice to bring the benefits of CTI to office automation applications in client-server computing environments.

CallVisor for UNIX uses the PC/ISDN Platform to provide connectivity to your DEFINITY ECS system. The software includes an application programming interface that allows you or vendors to develop applications that communicate and utilize the information provided by the ASAI link.

The Novell Telephony Service for Netware is an example of a product that brings you the benefits of linking your DEFINITY ECS with your computing environment. Telephony Service for Netware links Novell's Netware to your DEFINITY ECS, providing access to common telephone features, such as autodialing, conference calling, and message management in combination with information stored in your client-server computing environment. The software also includes a Lucent PassageWay desktop application that gives you the ability to speed-dial calls and take notes that are associated with each call. Notes from previous conversations are available with each call.



1)	DEFINITY ECS	8)	Personal Computer/ISDN Platforms
2)	Primary Rate Interface	9)	CallVisor ISDN Gateway
3)	CallVisor Adjunct Switch Applications Interface; Call monitor and control, Station monitor and control	10)	Calling number, Called number, Agent extension
4)	CallVisor for UNIX	11)	Inbound Call Management
5)	Adjunct Switch Applications Interface; Call events, Outbound call requests, Routing requests	12)	Voice Response Applications, Inbound Call Management
6)	Conversant Voice Information System	13)	Call Center, Office Automation
7)	Digital Communications Protocol/Basic Rate Interface	14)	Call monitor and control, Station monitor and control

Figure 4-1. DEFINITY ECS and CallVisor Adjunct Switch Applications Interface

CallVisor ASAI Gateway

The CallVisor ASAI Gateway provides ASAI capabilities for the DEFINITY Generic 2 system. See your Lucent Technologies account team if you would like additional information on migrating your CallVisor ASAI Gateway to the DEFINITY ECS architecture.

CallVisor Services

With Lucent Technologies CallVisor Services Offerings, you can select the level of service that meets their specific business needs. For instance, you can choose only standard installation and maintenance of your DEFINITY CallVisor products.

You can increase the level of service to include complete management of the call-flow design and/or project management of the installation and servicing of the entire system, including other vendors' equipment. CallVisor Enhanced Services can provide you with the convenience and security of having a single point of contact for design, installation, and maintenance of your computer-telephone integration links.

CallVisor ASAI implementation services are available as follows:

- Standard Installation — This option offers the services of technicians to install and test all components of the computer-telphone integration.
- Consultative Services — With this option, consultants are available to assist you in the technical management and design of your computer-telephone integration application. The following services are included:
  - Requirements Analysis — Includes surveying your current operating environment, proposed applications, and project goals and objectives with all parties involved in order to document the steps necessary to achieve success.
  - Call Scenario Development — Provides a detailed description of the handling of each call that will be involved in your call center. The call scenarios developed then become part of the computing environment ASAI requirements.
  - Call Center Consultation — Provides guidance in the design process for the Automatic Call Distribution portions of the project, including CMS report interpretation, split layout, and call handling in the ASAI environment.
  - General Consulting — Provides technical support to your application developer.
  - Functional Testing — Provides assistance in the design and execution of a test program to examine the deliverable components of your computer-telephone integration project.

— Acceptance Testing — Provides assistance in the design and execution of a project acceptance test plan.

- Single Point of Contact — With this service option, Lucent Technologies manages the entire implementation of call center components from all vendors involved. Consultative services must be provided with this service.

CallVisor ASAI Maintenance Services

- Standard Maintenance Agreement — This contractual service offering is an extension of your warranty and includes call receipt, fault isolation, and trouble resolution for Lucent Technologies elements of the computer-telephone integration link.
- Single Point of Contact — This enhanced service provides you with management of all ongoing servicing for all Lucent Technologies equipment as well as other vendors' products in your CTI environment.

Other Vendor Products

AT&T/Lucent Technologies and a number of vendors have announced and jointly developed products and services that make use of CallVisor ASAI as solutions for your business needs. These efforts protect your business investment in existing Lucent and other vendor hardware and software while expanding your network capabilities to incorporate new technologies and to meet constantly changing business requirements. At the time of this book's printing, the following vendor implementations have been announced and are available.

Historically, IBM's CallPath/400 provided a direct link to the DEFINITY ECS system via CallVisor ASAI. CallPath/400 now requires Switch Server/2 for DEFINITY integration. CallPath Switch Server/2 was enhanced to support integration with CallPath CICS on Systems 370 and 390. DEFINITY/IBM Integrations are now based on the CallPath Server/2 PS/2 platform, and the CallPath Server/6000 platform. Either of these servers can support a variety of clients.

Lucent Technologies and Dialogic Corporation have integrated the DEFINITY Callvisor ASAI and Dialogic's CT-Connect product. Because Dialogic corporation was formed from a division of Digital Equipment Corporation, Dialogic's CT-Connect also supports Digital Equipment Corporation servers.

Stratus Computers Incorporated and Lucent Technologies have worked together to provide an interface between Stratus Adjunct Interface and Lucent's CallVisor ASAI. Stratus offers a hardware fault-tolerant system targeted for customers' critical on-line call center applications. The Stratus system is based on ASAI code that was licensed from Lucent Technologies. This facilitates keeping the Stratus product updated as new DEFINITY ASAI features are added.

Tandem Computers Incorporated and Lucent Technologies have announced development of an applications interface to link Tandem NonStop fault-tolerant computer systems and the DEFINITY ECS. This agreement lets both companies offer new applications and benefits resulting from an integrated interface from Lucent Technologies systems to Tandem computers. Tandem's Call Applications Manager lets users collect incoming-call information, such as a caller's phone and account numbers, from a database within seconds.

Hewlett-Packard has also announced a product for its Applied Computerized Telephone product line to connect HP 3000 and HP 9000 computers to DEFINITY ECS. The product supports Lucent Technologies Adjunct Switch Applications Interface in client/server implementations.

Global Information Services has implemented a computer telephone integration server for the microchannel midrange line of products. The GIS server 3000 is based on ASAI code licensed from Lucent Technologies to facilitate implementation of new features. Working with several application vendors, GIS will support other systems beyond DEFINITY using a middleware-based link.

A Software Developer's Kit is available from Lucent Technologies that implements the ASAI interface for UNIX or Solaris® x86/Intel servers. The licensed software is bundled with an application package and re-sold to end users. This offering is primarily licensed to independent software vendors, value-added resellers, and systems integrators. Some technically advanced end users are also using the developer's kit.

Lucent Technologies will continue to develop agreements with other vendors, continually enhancing your investment in Lucent Technologies technology. Contact your local Lucent Technologies representative to get the latest information on switch-to-host products that you can use to improve your bottom line.

PassageWay

Lucent Technologies PassageWay products bring the telephone and the personal computer together into an integrated voice and data workstation that can greatly enhance communications. With PassageWay, you can efficiently process calls while accessing powerful voice and data features. It also permits you to connect to a variety of host computers and other PCs through the networking strengths of DEFINITY ECS. PassageWay provides error-free data transfer between your personal computers and other shared resources. You can even create your own applications to take advantage of the PassageWay connection.

PassageWay Direct Connection

PassageWay Direct Connection links your company's desktop personal computers with an easy-to-use Microsoft Windows interface to give you greater business communications capabilities than either the telephone or the personal computer offer alone.

PassageWay Direct Connection provides valuable computer-telephone integration benefits, plus it is a platform bridge to a wealth of other computer-telephone integration applications. Open Application Programming Interface support and Windows Dynamic Data Exchange support allow independent software vendors or internal software developers to create new computer telephone integration applications or to enable existing applications to be interfaced to the telephone. These independent software vendor's products utilize the PassageWay platform to expand the power and flexibility of computer telephone integration at the desktop.

The PassageWay Direct Connection software applications are for the individual desktop personal computer. However, using the Application Programming Interface, Dynamic Data Exchange, or independent software vendor's products, PassageWay Direct Connection can be linked to the your Local Area Network.

PassageWay Direct Connection is well-suited for those users who are constantly conducting business using both the a Windows-based personal computer and an Lucent Technologies telephone and want to boost their efficiency.

Here is a list of the computer telephone integration software applications included with each PassageWay Direct Connection product:

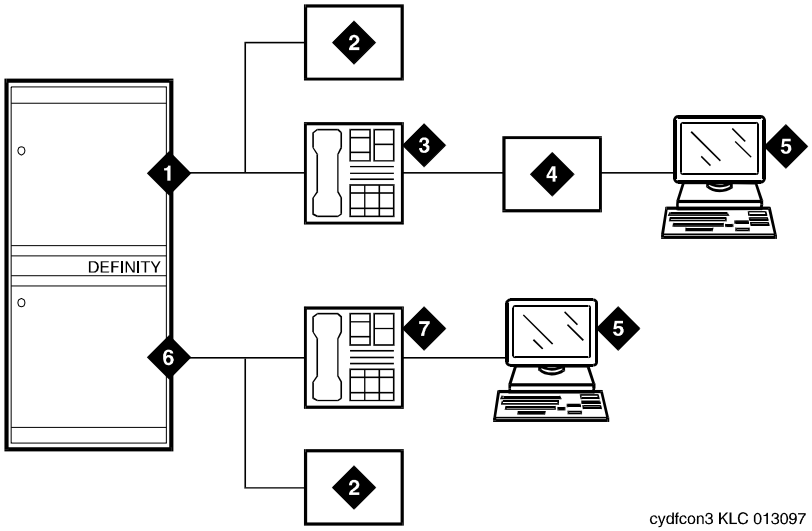
- AT&T Call is a software card-file database that allows a customer's record to be previewed, the appropriate telephone number to be automatically dialed, and notes to be taken quickly all with just a few mouse clicks.
- AT&T Buzz instantly retrieves and displays the AT&T Call record associated with an incoming call based on the Calling Party's Telephone Display Information (Automatic Number Identification, Call Prompting, Conversant). AT&T Buzz also allows users to answer incoming calls from their personal computer with only a single mouse click.
- Log Viewer automatically maintains a record of every call either made from AT&T Call or received from AT&T Buzz.

PassageWay Direct Connection supports international companies that need A-law support and/or 8400 series telephones, which allow both two-wire and four-wire connections.

The following system requirements must be met for PassageWay Direct Connection to function properly:

- An IBM Compatible personal computer with:
  - 386 or higher microprocessor
  - Two megabytes of RAM (4MB recommended)
  - Two megabytes of hard disk space
  - 3.5” or 5/25” disk drive
  - An available serial port
  - Mouse or trackball
  - VGA (or higher resolution) monitor
- Microsoft Windows 3.1 or higher (in standard or enhanced mode) or Windows for Work Groups 3.11 or higher
- A DEFINITY ECS and one of the following telephones:
  - 7400 series telephone
  - CALLMASTER 4-wire Digital Communications Protocol telephone (with adjunct power)
  - 8400 series telephone
  - 6400 series telephone
- Local adjunct power (or closet power) for the DEFINITY PassageWay Direct Connection device

The 8411 telephone can integrate PassageWay within the phone itself. Figure 4-2 shows a couple of typical PassageWay configurations.



1) 2- or 4-wire DCP Port
2) Auxiliary Power
3) DCP Telephone
4) Passageway
5) Personal Computer
6) 2-wire DCP Port
7) 8411 DCP Telephone w/ PassageWay

Figure 4-2. PassageWay Direct Connect Configurations

PassageWay Fast Call for Direct Connection

PassageWay Fast Calling Feature for Direct Connection is a Windows-based application which was developed by Aurora Systems for a variety of Lucent Technologies computer telephone integration platforms including PassageWay Direct Connection, PassageWay Telephony Services, and PC/Switch. The Fast Calling Feature delivers multiple computer telephone integration capabilities for Call Center and other computer users workers in your company. These capabilities include:

- Instant account information on screen (based on Calling/Called Party and/or Caller Input Identification)
- Coordinated Voice and Data Transfer
- Outbound Preview Dialling
- Inbound Call Handling Rules (user-defined call coverage)
- Personal computer-based telephony (activation of Conference, Transfer, Drop, and Hold from the personal computer)

The Fast Calling Feature resides between PassageWay and any Windows-based application on your Local Area Network, desktop personal computer, or mainframe. This approach allows existing applications to be simply and quickly "telephony enabled" without the need for low-level software development. The Fast Calling Feature takes advantage of simple keyboard recorded scripts and macros.

The primary users of the Fast Calling Feature would be Call Center Agents or employees who use a personal computer in their work. If these users want to automate their existing Windows application to perform one of the five tasks listed above, Fast Calling can enable them to do just that.

PassageWay Telephony Services

PassageWay Telephony Services connects the DEFINITY ECS and Novell Networks. Developed in partnership with Novell, it allows you to integrate a variety of communications systems and software in one network. Its open architecture is based on the ECMA CSTA international standard. Besides standard Windows environments, PassageWay Telephony Services supports Windows NT, OS/2, Macintosh, and UnixWare operating systems on a Novell NetWare LAN. The Telephony Services Applications Programming Interface enables you to coordinate the applications on the network. The programming interface is supported by 30 telecommunications vendors.

The Bulk Administration feature allows you to use existing databases to provision the telephony server. You can also create filters for integrating the information the server requires, using a variety of software to manipulate the data. The LAN Traffic Measurements Utility provides tools for measuring LAN traffic versus telephony traffic.

The PassageWay Telephony Services installation programs and documentation are provided in U. S. English, French, German, Spanish, and Italian. See your local distributor for information on whether other languages are available.

Hospitality Solutions

5

Keeping guests happy is essential in the lodging business. DEFINITY ECS offers an array of features that enhance guest services, including some that were previously only available on Lucent's smaller GuestWorks™ *server*. Essential GuestWorks functions are now available through DEFINITY ECS. You can thus enjoy robust hospitality functions on a state-of-the-art communications system that easily accommodates growth.

For example, DEFINITY ECS can provide:

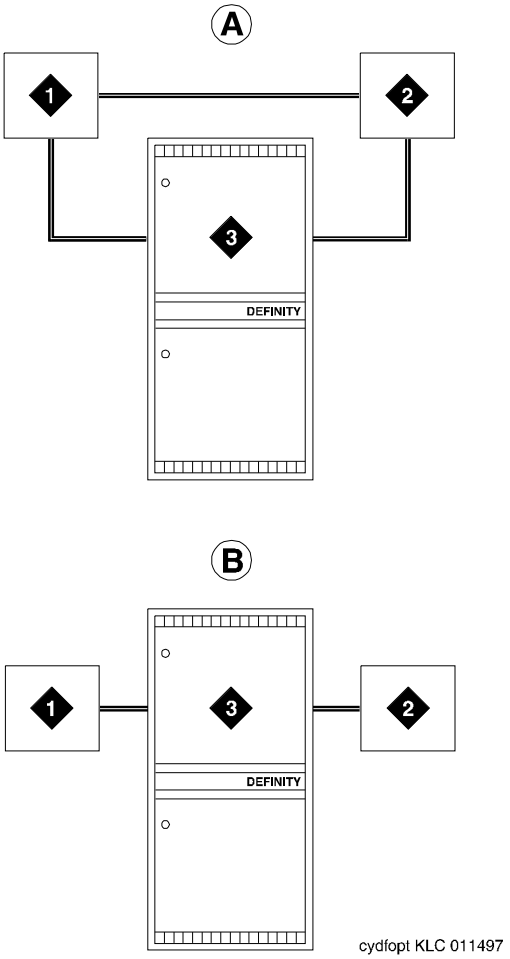
- Automatic wakeup for guest rooms. Assisted by voice prompts or tones, guests can request their own wakeup call. The wakeup call can be as simple as silence, or as elaborate as a custom sales message in the native language of the guest, tailored to the time of day and day of the week.
- A check-in and check-out button on the attendant console. When a guest is checked in, the desk clerk presses the check-in button; the server prompts for an extension number, marks the room as occupied, and turns the telephone on. At check-out, the reverse happens.
- Feature access codes to signify certain conditions. For example, maids can use the telephones in the rooms to change the room status from "dirty" to "clean and ready for occupancy."
- A Do Not Disturb feature that turns off ringing in a room, except for designated priority calls and automatic wakeup calls.
- Guest voice messaging, which unburdens attendants and provides guests with an important convenience.
- Controlled Toll Restriction, which allows you to restrict some telephones from making toll calls. In this way hotels can provide free local calls, while still restricting toll calls.

Lodging establishments often use three systems together:

- DEFINITY ECS
- A property management system
- Lucent Technologies INTUITY Lodging

Property management systems are used for making guest reservations, checking guests in and out, printing guest bills, and other accounting functions. INTUITY Lodging provides a variety of voice messaging and fax functions for guests, and includes flexible administration capabilities that simplify moves and changes.

As the centerpiece of the hospitality communications network, DEFINITY ECS continues to refine its integrating capabilities. For example, recent message tandeming enhancements make it unnecessary for INTUITY Lodging and the property management system to be directly connected (See Figure 5-1.)



A) Before message tandeming

B) After message tandeming

1) INTUITY Lodging

2) Property Management System

3) DEFINITY ECS

Figure 5-1. DEFINITY ECS Hospitality Integration

The general advantages of using DEFINITY ECS in the Hospitality industry are touched upon in *Chapter 2, "Industry Applications".* The following sections provide a closer look at INTUITY Lodging, the GuestWorks enhancements of DEFINITY ECS itself, and DEFNITY ECS's communications with property management systems.

INTUITY Lodging

Lucent Technologies INTUITY Lodging is a messaging system designed especially for lodging establishments such as hotels or other lodging providers such as hospitals or colleges. The system supplies guests with electronic mailboxes that store voice or fax messages. INTUITY Lodging serves as a private answering machine for each extension.

Users are greeted with spoken prompts that guide them in pressing keypad buttons to make choices Because touch tones are not needed to leave a message for a guest, outside callers may use rotary phones.

Hotel guests can leave messages for each other without going through the attendant. For incoming calls, an attendant transfers the call to the appropriate room. If the guest does not answer the call or if the line is busy, the call is automatically transferred to the guest's voice mailbox, where the caller can leave a voice message.

A message-waiting indicator on the guest's phone notifies the guest that the voice mailbox contains messages. Guests are assigned a password for accessing messages remotely. They can retrieve and save messages from any telephone, on or off premises.

Calls are transferred to an attendant when any caller:

- Presses 0 at any time (for assistance)
- Leaves a maximum-length message
- Stays on the line after leaving a message
- Is silent when prompted to leave a message

Fax Messaging

With the Fax Messaging option, the caller can leave a fax by simply pressing a key when prompted and starting the fax transmission. The fax is stored until the guest, instructed by the system's voice prompts, does one of the following:

- Sends it to a common printer
- Sends it to a personal printer
- Retrieves it into a portable computer
- Forwards it to another location

Guests or administrators can also send faxes to multiple locations simultaneously.

Language Options

Guests can hear voice mail prompts and menus in one of several languages. Up to nine different languages may be installed and used at the same time. The attendant enters the guest's desired language at check-in time. The guests will hear menus and prompts in their chosen languages after logging in to retrieve messages. Contact your account representative for language options.

Call Accounting

Call Accounting takes call records supplied by the server, puts the records into a standard bill format, and sends the billing information to the property management system. When guests check out, their long distance calling charges are printed automatically on their bill. This gives you better control over telephone usage revenue.

Additional Features

INTUITY Lodging includes many features similar to those of DEFINITY AUDIX and INTUITY AUDIX. (For more information, see Chapter 9, "Voice Processing Solutions"). Guests may record their own personal greetings, for example, and broadcast messages to many recipients simultaneously.

When guests change rooms, their voice mailboxes can move with them. Attendants can change room A with room B, transfer room A to room B, or merge room A with room B so messages are not missed. Security and backup features protect privacy and ensure that information is not lost.

System administrators have many options for controlling the operation of INTUITY Lodging. For example, they can:

- Set fax options
- Customize the voice prompts
- Designate call coverage paths
- Define conditions under which callers are automatically sent to an attendant

DEFINITY ECS Hospitality Enhancements

DEFINITY ECS inherently provides some of the features of Lucent Technologies' Guestworks *server*, a smaller communications server designed for the hospitality industry. Recent enhancements to DEFINITY ECS provided additional hospitality features. The primary enhancements are:

- Message Tandeming
- Dial by Name
- Dual Wakeup
- Attendant Backup
- Attendant Crisis Alert

Message Tandeming

DEFINITY ECS tandems messages between the property management system and INTUITY Lodging so the systems need not be connected to each other. The following property management system messages are tandemed:

- check-in
- check-out
- room-data-image
- guest information
- message waiting
- room-swap

Attendant Backup

The Attendant Backup feature allows you to access most attendant console features from one or more specially-administered backup telephones. This allows you to answer calls more promptly, thus providing better service to your guests and prospective clients.

When the attendant console is busy, you can answer overflow calls from the backup telephones by pressing a button or dialing a feature access code. You can then process the calls as if you are at the attendant console. The recommended backup telephones are the Lucent Technologies Models 8434, 8410, 6408D+, 6416D+, and 6424D+.

Attendant Crisis Alert

The Attendant Crisis Alert feature provides a visual, audible, and printed record when guests or staff place a call to the local emergency service agency. This gives hotel personnel the ability to assist emergency personnel when they arrive at the hotel by identifying where the call came from and when the call was made. This feature uses the Automatic Route Selection feature to allow routing of any emergency service access code to the appropriate emergency service agency, while also identifying the call for crisis alerting.

After the emergency call is placed and successfully routed to the local emergency service agency, the attendant console is notified immediately by a special emergency alerting tone and a special emergency display (the emergency call itself cannot be answered at the attendant console, but the call information is displayed). The attendant can then note the room number and contact the appropriate personnel at the hotel to assist with the emergency.

When someone makes an emergency call, the following happens:

- The call is routed to the local emergency service agency. The call does not route to the attendant console.
- The *Position Available* lamp goes off and the Pos Busy lamp goes on. This prevents new incoming calls from interrupting this emergency notification. All new incoming calls are queued and can be answered after the emergency notification is processed.
- The Crisis Alert lamp flashes.
- The special emergency alerting tone starts.
- The following is displayed at the attendant console:

```
a=  <Name>        <Ext No.>    EMERGENCY
```

- The call information is logged in the server and is printed on the journal/schedule printer (if administered).

The attendant turns the lamp and tone off by pressing the Crisis Alert button repeatedly. Each subsequent emergency notification is queued with a 5-second delay to allow the attendant to finish processing each notification.

E911/CAMA Trunk

The E911/Centralized Automatic Message Accounting (CAMA) trunk interface circuit packs allow DEFINITY to interface with CAMA trunks and to provide Caller's Emergency Service Identification (CESID) information to the local community's Enhanced 911 system through the local central office.

Communications with Property Management Systems

DEFINITY ECS exchanges guest status information (room number, call coverage path, etc.) with the property management system. There are two ways that the guest data can be encoded:

- Using a combination of Binary Coded Decimal encoding and the ASCII character set
- Using only the ASCII character set

As an additional GuestWorks enhancement, DEFINITY ECS can now use the newly preferred ASCII message set in addition to the mixed BCD/ASCII message set. In this way DEFINITY ECS is compatible with a wide range of property management systems: established systems that use a combination, and new systems that exclusively use ASCII.

Mobility Solutions

6

Most businesses today struggle to improve customer service and increase profits while they control costs and staff size. That means employees have to be more productive, more responsive, and often more *mobile.* Wireless solutions allow you to control costs by reducing time and resources spent on paging employees, interrupting work to find a phone, rushing to answer calls, or being tethered to the desk waiting for an important call. Reliable wireless tools remove the fear of losing customers who couldn't wait to reach you directly.

Lucent Technologies is the top U. S. provider of wireless solutions for business. Lucent's FreeWorks™ Solutions offer a range of options from cordless telephones to integrated cellular business systems that greatly enhance the flexibility of wireless telephones.

NOTE:
Some applications and products are unavailable in some countries. Please check with your local distributor for further information about which features and applications are available to you.

Cordless Solution

Lucent's cordless telephones and speakerphones give you complete freedom to make and receive calls around your immediate work area. The Multiline Digital Cordless Business Telephone features crystal clear voice quality, consistent privacy and secure operation. It also includes an intercom feature, conference and transfer capabilities, and programmable feature buttons.

Medium Range Mobility Solution

AT&T's TransTalk 9000 (Figure 6-1) is a multiline, single zone solution that allows you to roam up to 700 feet (230 meters) from the base station. It effectively covers up to 500,000 square feet (150,000 square meters) in most business environments.

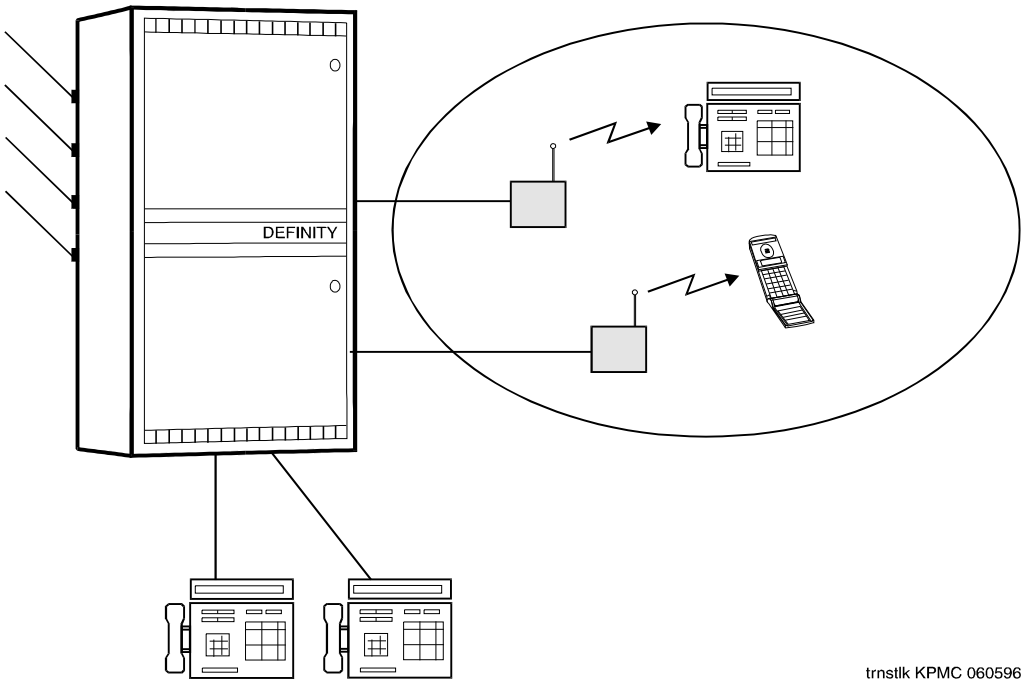


Figure 6-1. TransTalk 9000

TransTalk 9000 is available in two configurations:

- Complete System, consisting of a carrier that holds up to six radio modules, MDW 9000 wireless telephones, and corresponding charging cradles, radio modules, and holsters.
- Stand-alone, consisting of a single radio module, wireless telephone, charging cradle, and holster.

The wireless telephones have all the same features as the cordless business phone, plus these additional ones:

- Automatic registration
- Trouble lights
- Extended battery life

- Battery pack and optional battery backup
- Rapid battery charger (2 1/2 hours)
- Dynamic power adjustment
- Mute button
- Mobility range test capabilities

Long Range Mobility Solutions

Lucent Technologies offers two robust systems that will keep you in touch with customers, coworkers, and suppliers wherever you go in your office complex—desk-to-desk, office-to-office, or office-to-warehouse. In both systems, overlapping zones allow you to move about freely without changing phones (Figure 6-2). The phone connection is “handed off” from one transmitter to another as necessary (within the influence of a single radio controller).

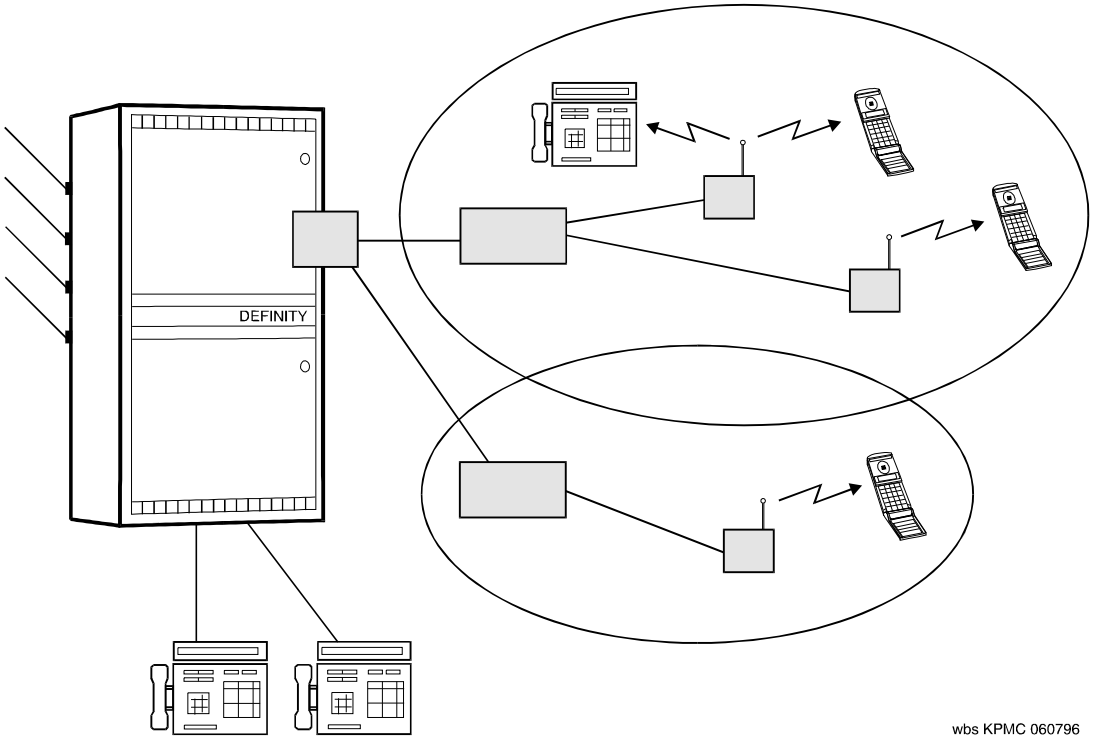


Figure 6-2. Long Range Mobility Solutions

The DEFINITY Wireless Business System and the Forum™ Personal Communications Manager are similar in many respects. The DEFINITY Wireless Business System can be integrated with the DEFINITY ECS, and thus has some inherent efficiencies. The Forum uses an adjunct device but offers slightly higher capacities. It also uses an international industry standard that is more common in some parts of the world.

Both systems feature Lucent's Wireless System Engineering Expert Design System. This patented software, which is unique in the wireless industry, analyzes the building or campus space and determines how the wireless system should be configured. It precisely locates base stations within the structure or structures. The software effectively eliminates the most difficult aspect of wireless implementation and ensures maximum efficiency and lower life cycle costs.

DEFINITY Wireless Business System

The DEFINITY Wireless Business System relies on the DEFINITY ECS system to manage mobility. It uses Personal Wireless Telecommunications technology, which is a leading protocol in the United States. This standard, which has the primary advantage of permitting up to 12 simultaneous conversations per base station, defines the radio interface between the portable telephones and the base stations in the system.

The DEFINITY Wireless Business System is fully integrated with the DEFINITY ECS, and offers users full access to the DEFINITY ECS features. The system has the following maximum capacities:

- 260 wireless telephones
- 60 base stations
- 7,000 to 40,000 calls per busy hour (depending on DEFINITY ECS configuration)
- 4 million square foot (1.2 million square meter) coverage area

Forum Personal Communications Manager

The Forum Personal Communications Manager uses a Forum switch, which can serve as an adjunct to DEFINITY ECS, to manage mobility. The system uses Cordless Telephone Generation 2 (CT2) technology, which is a global standard for wireless telephone service. This standard defines the radio interface between the Forum pocket telephones and the base stations in the system.

Forum's System Manager provides superior system administration capabilities. The Forum Personal Communications Manager can accommodate even the largest businesses. It has the following maximum capacities:

- 500 wireless telephones
- 126 base stations

- 6 PRI interfaces
- 1 Sun workstation
- 4 million square foot (1.2 million square meter) coverage area

Telecommuting Solutions

7

Lucent Technologies research, supported by industry studies, shows that telecommuters are generally 15 to 30 percent more productive when they work at home. They convert travel time into productive work time, are less likely to be distracted by normal office routines, and frequently end up working longer hours with greater output. During severe weather, they can continue working when others cannot.

Special DEFINITY system modules are available for telecommuting. In addition, many standard DEFINITY ECS and voice messaging features work well for telecommuters.

DEFINITY Extender

DEFINITY Extender allows you to use a fully functional DCP telephone at a remote location. The telephone looks and performs exactly as if it were directly connected to your office DEFINITY ECS.

The system uses a module at the DEFINITY system and a module at the remote location to provide full service. The Extender works with the 8410D, the 8434, and the 603E DCP telephones. Since these DCP phones have displays, the system works well for call center agents working from home. A dial-in number and password makes the system reasonably secure from unauthorized use.

Lucent Technologies TelecommuterModule

Lucent Technologies Telecommuter Module is a lower-end telecommuting solution that is ideal for telecommuters who are not necessarily call center agents. Incoming calls are redirected to the telecommuter's home number and redirected

back to call coverage (voice messaging or an attendant) if the telecommuter is busy or unavailable. The seamless connections give the caller the impression that the telecommuter is actually in the office.

The module makes the power of DEFINITY ECS available to telecommuters from any touch-tone phone. They can:

- Transfer a call
- Set up a conference call
- Use abbreviated dialing
- Place long-distance calls
- Receive, leave and retrieve voice messages

Telecommuters need not always be at a fixed location, as the target telephone number is easily changed. The modules can be reprogrammed to accommodate different users as well. The module can be set up in two modes:

- Per Session Mode (intensive calling requirements), in which a continuous link is maintained between the telecommuter's phone and the office DEFINITY ECS. It eliminates the need to log in and log out when making calls. The telecommuter's phone is continuously off-hook, and incoming calls indicated by a distinctive tone.
- Per Call Mode (moderate calling requirements), in which the employee must log in to make calls or use DEFINITY features. The module rings the telecommuter's phone when incoming calls arrive, using a distinctive tone. This allows the employee to distinguish between business and personal calls so he or she can answer appropriately.

Each module can be shared by as many as 25 users (though only one may be logged in at any one time). Several security features make it difficult for the system to be abused by hackers.

DEFINITY ECS Features for Telecommuting

DEFINITY ECS includes several features for the convenience of telecommuters:

Remote Call Coverage/ Call Forwarding Off-Net

Remote Call Coverage and Call Forwarding Off-Net allow calls to be redirected to a remote location. This allows you to have calls placed to your on-site office redirected to your home office. You can administer the system to either monitor calls and bring them back for additional processing if not answered or to leave calls at the remote (off-net) location.

Extended User Administration of Redirected Calls (Telecommuting Access)

Extended User Administration of Redirected Calls (also called Telecommuting Access) allows you to change the lead call coverage path or forwarding extension from any on-site or off-site location. Thus you can change the path or extension from your home office, for example.

Personal Station Access

Personal Station Access allows you to transfer your telephone station preferences and permissions to any other compatible telephone. This includes the definition of terminal buttons, abbreviated dial lists, and Class of Service and Class of Restrictions permissions. It can be used on-site or off-site (with DEFINITY Extender). This has several telecommuting applications. For example, several telecommuting employees can share the same office on different days of the week. The employees can easily and remotely make the shared telephone "theirs" for the day. Remote use requires DEFINITY Extender (described on page 7-1).

Station Security Codes

Station Security Codes protect access to telephone stations. Now these codes can be changed by the telephone users. This allows you to easily ensure protection of your console features.

All of these features are described in detail in the *DFEFINITY ECS R5.4 Administration and Feature Description* (555-230-522) under the following feature names:

- Call Coverage
- Call Forwarding
- Extended User Administration of Redirected Calls
- Personal Station Access
- Station Security Codes

AUDIX Features for Telecommuting

The following DEFINITY (and INTUITY) AUDIX features are useful for telecommuting:

- *Multiple Personal Greetings* allow subscribers to prepare a pool of up to nine personal greetings to save time and provide more personal customer service. Separate messages can indicate the subscriber is on the phone, away from the desk, on vacation, etc. Different messages also can apply to internal, external, or after-hours calls.

- *Outcalling* automatically dials a prearranged phone number or pager when messages are received in a user's mailbox. The system tells whoever answers that messages have been received.
- *Priority Outcalling* provides outcalling notification of priority messages only. This allows the telecommuter to be relatively undisturbed by notifications of messages that do not require immediate attention.
- *Call Answering for Nonresident Subscribers* provides AUDIX System mailboxes for users who do not have an extension number on the DEFINITY system.

For example, when working at home, you set up Priority Outcalling so the system will call you when you have important messages. Then you activate a personal greeting that says something like, "Thanks for calling. I'm working away from the office today. I'll be checking voice mail periodically, so please leave a message. If your message is urgent, press 2 after recording it. This will give your message priority status. The system will notify me of your priority message almost immediately."

CONVERSANT Features for Telecommuting

The CONVERSANT Voice Information System also has built-in advantages for telecommuters. For example, it provides a fax mailbox for easy storage and access of faxes. It also allows salespeople to obtain information easily and enter orders from a remote location.

CONVERSANT also makes it easy for call center attendants to work at home using analog telephones. The HOME AGENT application assigns two analog ports on the DEFINITY system to each agent. The telecommuters appear to the system and to callers as on-site agents.

The agent working at home uses an analog feature telephone. No display information can be provided to the agent, but the CONVERSANT system can speak to the agent during a call, supplying call processing status and other information. Log-ins and passwords help keep the system secure.

Data Management Solutions

8

DEFINITY ECS is designed for fast, efficient, and reliable movement and management of data as well as voice information. All information transmitted through the system is carried in a digital format. Analog signals — both voice and data — are converted to digital form before being switched. Analog data compatible with data modules and fax machines can be transmitted through DEFINITY ECS at speeds up to 28.8 kbps. Digital data can be transmitted at speeds up to 64 kbps per channel.

Data Communications Capabilities

Whether your data environment is asynchronous, synchronous, or a combination of both, DEFINITY ECS's data-switching capabilities can greatly enhance your company's data communications. Using DEFINITY ECS to switch your company's data has many possible benefits:

- It can greatly reduce the number of terminals and amount of cabling required.
- It enables employees to gain needed access to host computers, applications, and databases.
- It provides connectivity between different data environments that your company may have — asynchronous, synchronous, and personal computer environments.
- The jacks, twisted-pair wiring, and optical fiber used by the premises distribution system contribute to easy installations and easy moves.
- Voice and data are integrated and transmitted over the same wires; employees can exchange data and discuss it over the phone at the same time.

- Your data communications system will benefit from many of DEFINITY ECS's capabilities. For example, voice features such as Abbreviated Dialing, Queuing, and Automatic Route Selection can also be applied to data communications. DEFINITY ECS's networking strengths can expand data connectivity to wider areas. And its system management capabilities can monitor and control your data communications.

DEFINITY ECS can be used in a variety of data applications. The ones listed below are just a few examples of the many ways in which you can use DEFINITY ECS to improve your data communications:

- Switched asynchronous host-computer access
- Switched synchronous host-computer access
- Off-site computer access via modem pooling
- Local area network bridging
- Information System Network access
- Personal computer networking
- Switched videoconferencing
- FAX networking

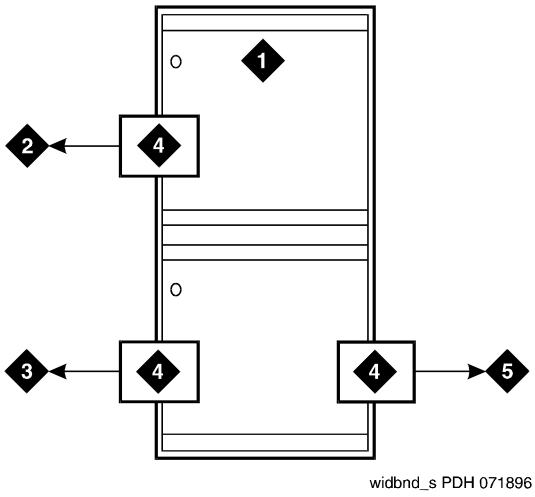
See your local distributor for information on how you can make DEFINITY ECS's data communications capabilities work for you.

NOTE:
Some applications and products are unavailable in some countries. Please check with your local distributor for further information about which features and applications are available to you.

Data Management Features

DEFINITY ECS offers a number of data management features to help control your data environment and allow users quick and convenient access to data. Appendix B, "System Capacity Limits" contains a list of these data management features. The following list introduces just a few of these features:

- Wideband Switching (Figure 8-1) provides switching and networking capabilities to support end-to-end wideband connections between customer endpoints in either dedicated or switched networks connected to the DEFINITY ECS. Multiples of 64 kbps (*n* x 64) are supported, providing compatibility with AT&T 384 kbps and 1.536 Mbps (H0 and H11) network services. The DS1 Interface Circuit Pack serves as both the line side and trunk side interface.



1) DEFINITY ECS
2) ISDN-PRI to a Wideband Application
3) Fractional T-1 to Wideband Application
4) Digital Signal Level 1
5) ISDN-PRI to Switch or dedicated network

Figure 8-1. DEFINITY ECS Wideband Switching Supports Your High-Speed Data Communications Requirements

- Administered Connections automatically establish an end-to-end connection between two data endpoints. An administered connection can be either permanent or scheduled. The feature supports Auto Restoration (preserving the active session) for connections routed over Software-Defined Data Network trunks and an administrable retry interval (from 1 to 60 minutes) to re-establish a connection. The resulting benefits are increased reliability of your data networks and improved disaster recovery.
- Alphanumeric Dialing enhances computer dialing by allowing a computer user to place a data call by entering an alphanumeric name, making dialing both convenient and user-friendly. When an alphanumeric name is entered from a user's terminal, the system converts the name to a sequence of digits by searching through an administered alphanumeric dialing table. The system then dials those digits just as if the user had entered the digits.

- Default Dialing enhances computer dialing by allowing a computer user to place a data call to a pre-administered destination by simply entering a carriage return at the “DIAL:” prompt. This gives computer users who dial a specific number the majority of the time a very simple method of dialing that number.
- Data Call Setup enables you to set up data calls (at any of the industry-standard rates) using a telephone or a computer keyboard.
- Data Hotline enables you to administer a data module so that when the module goes off-hook the data call is immediately placed to the preassigned number. This feature may also be used to restrict a data module to the assigned number only.
- Data Protection prevents disruption of data transmissions by DEFINITY ECS’s other features or tones. Both the originating and terminating ends of the call are protected.
- Data Communications Access allows you to communicate with a computer via analog trunks.
- Host-Computer Access allows data endpoints with data modules to access a computer directly.
- Modem Pooling allows conversion resources to be grouped into pools and shared for access to analog facilities, eliminating the need for a dedicated modem at every terminal.

Digital Interfaces

Lucent Technologies DEFINITY ECS offers powerful digital interfaces for high-speed voice, data, and integrated voice/data transmission.

- Lucent Technologies Digital Communications Protocol, a key part of DEFINITY’s digital architecture, provides integrated voice and data communications between terminals and the system.
- Lucent Technologies Digital Multiplexed Interface is a high-speed, economical interface for terminal-to-host, switch-to-host, and host-to-host communications.

DEFINITY ECS supports a wide variety of bit-oriented signalling formats on Digital Signal Level 1 (1.544-Mbps) facilities, compatible with local CO services, AT&T nodal network services (such as AT&T MEGACOM services), and services conforming to European Conference of Postal and Telecommunications standards in the international marketplace (2.048-Mbps).

DEFINITY ECS implements both standard ISDN interfaces: ISDN-PRI and ISDN-BRI. It is one of the first systems to make both ISDN interfaces available at all line sizes — small, medium, or large. With both interfaces, Lucent Technologies delivers the advantages of full end-to-end ISDN connectivity to every desktop.

Digital Communications Protocol

Digital Communications Protocol (DCP), a forerunner of ISDN-Basic Rate Interface, has been the architectural foundation for Lucent Technologies digital servers and switches. It provides advanced ISDN-like functions by integrating voice and high-speed data. DCP continues to serve as a key digital interface for DEFINITY ECS.

Like ISDN-Basic Rate Interface, DCP defines the communications interface between a terminal and the switch. It consists of two 64-kbps information (or bearer) channels and a separate 8-kbps channel for signalling and control information (or data channel). Out-of-band signalling via the data channel allows the information channels to be used for clear-channel transmission.

DCP's framing structure allows voice, data, and signalling information to be transmitted with low overhead and virtually free of errors. DCP transmits at a rate of 8,000 frames per second or 160 kbps. DCP allows data and digitized voice to be multiplexed on one or two twisted pairs, terminating in a standard telephone jack.

Digital Multiplexed Interface

DEFINITY ECS supports high-speed, efficient data communications through Lucent's Digital Multiplexed Interface. Digital Multiplexed Interface allows communications between a terminal and host computer, between a switch and host computer, and between two host computers.

Digital Multiplexed Interface is consistent with ISDN-PRI. 24 64-kbps channels (one of which is reserved for signalling information) transfer data between two endpoints through the DEFINITY ECS. The multiplexed channels can be sent over standard Digital Signal Level 1 facilities, allowing the host computer to be located remotely.

Digital Multiplexed Interface offers two major advantages. It delivers a standard, single-port interface for linking host computers internally and externally via T1 carrier. And, since it is compatible with ISDN standards and is licensed to numerous equipment manufacturers, it promotes multi-vendor connectivity.

DEFINITY ECS supports two versions of Digital Multiplexed Interface, each differing in the way information is carried over the 24th channel:

- Digital Multiplexed Interface-bit-oriented signalling carries framing and alarm data and signalling information for connections to host computers and other vendor equipment.
- Digital Multiplexed Interface message-oriented signalling, fully compatible with ISDN-PRI, uses the same message-oriented signalling format, Link Access Procedure on the D-channel, as ISDN-PRI for control and signalling. These signalling capabilities extend the advantages of Digital Multiplexed Interface-Message Oriented Signalling multiplexed communications to the public ISDN network.

Both Digital Multiplexed Interface-Bit Oriented Signalling and Digital Multiplexed Interface-Message Oriented Signalling use 23 information (bearer) channels and one signalling (data) channel multiplexed on a 1.544-Mbps Digital Signal Level 1 carrier link.

ISDN-PRI

ISDN-PRI delivers ISDN service to DEFINITY ECS for high-speed connectivity to the public switched telephone network and to other switches in a private or public network. It can also be used to connect to host computers that support the interface. PRI provides 24 64-kbps channels arranged in the North American ISDN standard of 23B plus D. That is, the 24 channels are divided into 23 bearer (B) channels at 64 kbps for information transmission and one signalling (D) channel at 64 kbps for control and signalling. Outside the United States, DEFINITY ECS also supports ISDN-PRI using the international E1 format, which provides 30B plus D.

DEFINITY ECS offers applications that use the ISDN-PRI. See Chapter 12, "Networking Solutions" for information on these applications.

ISDN-BRI

ISDN-BRI provides an international BRI platform that offers multiple protocol options to meet specific country and application requirements. This gives the customer an inexpensive way to connect DEFINITY to ISDN services provided by their local telecommunications network provider. It provides access to Video Conferencing, Desktop Video Conferencing, Data Transmission, and other non-voice based applications that use BRI as a communication interface.

ISDN-BRI supports the following country protocols:

- Bellcore National ISDN-1 protocol in the United States (TR268)
- National protocols in Australia (AUSTEL TS013, Telecom Australia TPH 1962), Japan (NTT BRI) and Singapore (FETEX 150 TIF 218)
- ETSI NET 3 protocol (ETS 300 102) for use in most of Europe

ISDN-BRI supports multipoint (up to two devices per port) only for the Bellcore National ISDN-1 Country Protocol option.

The ISDN-BRI Trunk, also called the Trunk-Side BRI circuit pack, allows DEFINITY to support the T interface and the S/T interface as defined by ISDN standards (ITU-T recommendation I.411). The circuit pack provides eight ports to the network and supports two B channels and one D channel. It supports essential (not supplementary) ISDN services.

Data Modules

Data modules connect DEFINITY ECS with other communications equipment, changing protocol, connections, and timing as necessary.

DEFINITY ECS supports the following types of data module:

- High Speed Links
- Data stands
- Modular-processor data module
- 7000-series data modules
- Modular-trunk data module
- Asynchronous data unit
- Asynchronous data module (for ISDN-Basic Rate Interface telephones)
- Terminal adapters

All of these data modules support industry standards and include options for setting the operating profile to match that of the data equipment. The data modules that are currently available with DEFINITY ECS are described below.

High Speed Links

The DEFINITY High Speed Link, a DCP-based data module, lets you transmit data through your DEFINITY Communications System at faster speeds, allowing you to take advantage of emerging technologies such as videoconferencing and Local Area Network bridging.

More and more companies are realizing that technologies and applications, such as Local Area Network-to-Local Area Network communication, videoconferencing, file transfer, and Group 4 fax transmissions are necessary to compete effectively in a global market. The DEFINITY High Speed Link offers you a cost-effective way to manage these applications.

Used when integrated voice and data is not required, the High Speed Link has an internally timed V.35 interface for synchronous data transmissions at 56 kbps (half and full duplex) and 64 kbps (full duplex) in both switched and permanent connections.

It offers access to low-cost, dial-up communications and provides a link to high-speed network services such as the ACCUNET Switched Digital Services and Software Defined Data Network Services. When accessing these network services, the High Speed Link can communicate with applications terminating on either a digital service unit or another High Speed Link.

Its numerous testing features make system fault isolation easy. For example, the High Speed Link offers a variety of client-or network-initiated loop-back tests that increase reliability, such as the capability to isolate problems remotely.

There is an interface that can be configured as an RS-366 Automatic Calling Unit or an RS-232 asynchronous data interface that supports a limited AT command set for call control.

All options are software definable and stored in nonvolatile memory. The reset options feature makes it easy to load default options. Designed to be easily upgraded, the High Speed Link has a memory cartridge interface for firmer upgrades to support new features.

The unit is externally powered, and it can be rack mounted with up to eight units and located up to 5000 feet (1525 m) from the DEFINITY ECS.

7000-Series Data Modules

The 7000-series data modules are designed to give you simultaneous voice and data access in a single, low-cost data module. The single DCP connection means you will never miss a voice call when you are on a data call.

The 7400B Plus and 7400A dual-function data modules provide full-duplex, asynchronous connectivity for DCP applications. They emulate the industry-standard Hayes modems and work with host-connection software packages that use the Hayes command set. Priced competitively with Hayes-compatible modems (that operate at 1200-2400 bps), the modules give you a choice of transmission speeds ranging from 300 bps to 19.2 kbps.

The 7400B Plus provides integrated, simultaneous, voice/data communications over twisted pair wiring. It is easy to install and operate and plugs into any modular DCP telephone outlet. It features two ports: a modular DCP port for a digital telephone and an RS-232 port for a personal computer or terminal.

In desktop configuration, the 7400B Plus provides twisted-pair connectivity for personal computers and asynchronous computers at transmission speeds ranging from 300 bps to 19.2 kbps. It operates with all 7400-series digital telephones, including the CallMaster Voice Terminal. On the trunk side, the 7400B Plus can connect to asynchronous host computers at speeds as high as 19.2 kbps.

The 7400A simplifies modem-pooling connections. It offers an alternative to the modular trunk data module in environments where only asynchronous communications capabilities are required. When used with the 7400B Plus on the desktop, the 7400A in the modem pool can raise system speeds while supporting Hayes-compatible communications packages. The 7400A features simple connections: one for a DCP line to the DEFINITY ECS, another for an RS-232 connection to Hayes-compatible modems.

The 7500B data module gives you synchronous or asynchronous connectivity for ISDN-Basic Rate Interface applications such as video conferencing, FAX, and personal computers at speeds up to 64 kbps. The 7500B features three connections: one to the Basic Rate Interface line to the DEFINITY ECS, one to a 7500-series telephone, and one (RS-232) to the computer. The module may be used stand-alone or in conjunction with a 7500 series telephone.

8000-Series Data Modules

The 8400B Plus data module is a 2-wire version of the 7400B Plus data module described in the previous section. The 8500B ExpressRoute 1000 is similar to the 7500B described on the previous section. It is designed for stand-alone configurations or for use with 8500-series telephones.

Asynchronous Data Unit

The asynchronous data unit offers an economic alternative to data modules for connecting Electronic Industries Association RS-232 data endpoints to the DEFINITY ECS. The Asynchronous Data Unit extends the 50-foot limitation of an RS-232 interface cable up to 40,000 feet (12,200 m), depending on the data speed and wire gauge of the distribution system. For example, a 19.2-kbps data rate can be supported to 2,000 feet (610 m). This allows RS-232 devices (such as terminals, host computers, multiplexers, printers, and personal computers) to be located great distances apart for private network applications. The Asynchronous Data Unit handles standard data rates from 300 bps to 19.2 kbps and nonstandard asynchronous data rates below 1,800 bps. It provides asynchronous full-duplex operation.

The multiple asynchronous data unit is a circuit board that contains eight asynchronous data unit circuits housed in one unit. These are typically used in computer-room applications where several RS-232 connections are carried in a common cable from the host computer.

The Asynchronous Data Module is used in conjunction with the 7505, 7506, or 7507 ISDN-Basic Rate Interface telephone to support integrated voice and data. With the Asynchronous Data Module, computers or personal computers attached to the telephone can send and receive data through the DEFINITY ECS. The Asynchronous Data Module mounts in the base of a 7500-series ISDN-Basic Rate Interface telephone and provides asynchronous full-duplex operation at data rates up to 19.2 kbps.

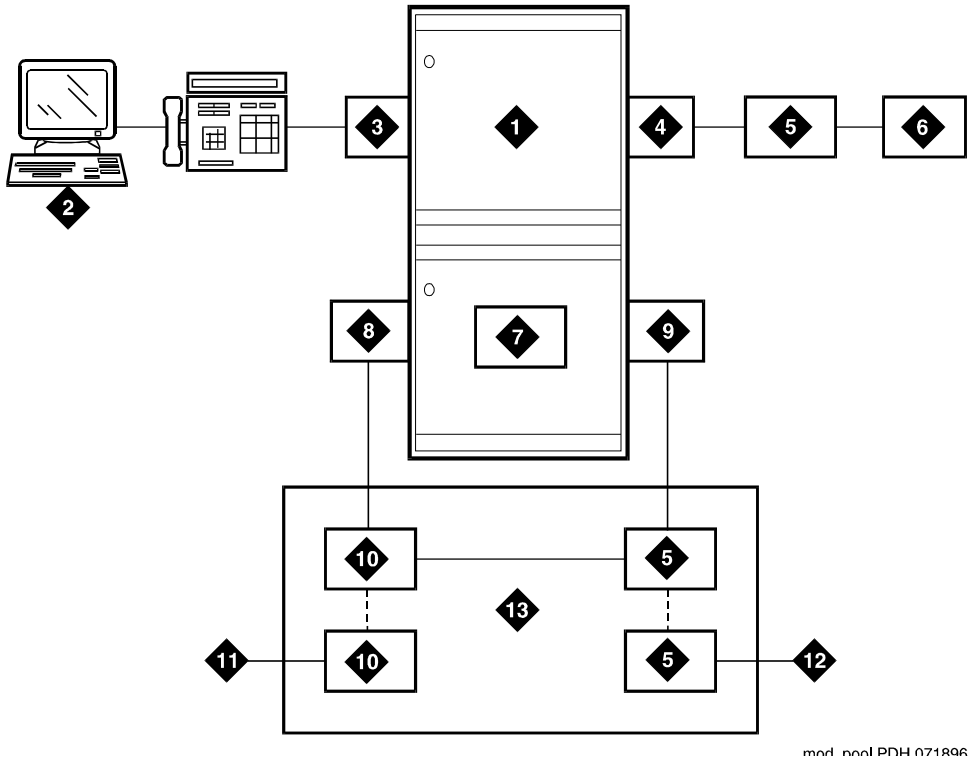
Modems and Modem Pooling

Since DEFINITY ECS is a digital system and many public and private network facilities are analog, internal data communications often require modems to convert from digital signals to analog signals and vice versa. Data modules, as discussed earlier in this section, provide an interface between DEFINITY ECS and various Data Communications Equipment and Data Terminal Equipment. They handle conversion between DCP or Basic Rate Interface and the RS-232 signalling protocol used by most modems and computers. The combination of a modem and data modules is called a conversion resource.

The DEFINITY ECS Modem-Pooling feature (Figure 8-2) eliminates the need for a dedicated modem at every terminal. It allows conversion resources to be grouped into pools and shared for access to analog facilities. Since the conversion resource is not permanently attached to the computer, the computer can

access digital or analog facilities at will. DEFINITY ECS inserts the conversion resources when appropriate.

DEFINITY ECS modem pools are assigned into modem pool groups. A group can have up to 32 modems, called “members.” DEFINITY ECS can have as many as 63 modem pool groups.



1)	DEFINITY ECS	7)	Integrated Pooled Modem
2)	Asynchronous Terminal	8)	Data Line Port
3)	Digital Port	9)	Analog Port
4)	Analog Trunk	10)	7400A
5)	Modem	11)	Digital Communications Protocol
6)	Remote Application	12)	Analog
		13)	EIA Standard

Figure 8-2. DEFINITY ECS Modem Pooling

Mode Code Interface

DEFINITY ECS supports an analog Mode Code interface for communications with INTUITY AUDIX and other voice mail systems using the same interface. This interface employs DTMF tones, line signals, and feature access codes, and allows INTUITY AUDIX to exchange data with the DEFINITY ECS without using a data link. Other adjunct vendors can engineer their products to use this interface.

Voice Processing Solutions

9

With less than 30 percent of person-to-person business calls reaching the intended party on the first attempt, day-to-day business can be frustrating. DEFINITY ECS integration with Lucent Technologies voice-messaging and voice-response products can help ensure that important calls are not lost.

Lucent Technologies voice messaging and voice response systems provide businesses with the voice processing tools to communicate more efficiently and make time spent on the job more productive. Whether your company has ten employees or thousands, Lucent Technologies can provide you with an innovative voice processing solution.

Voice messaging bypasses idle chatter to promote a communications mode that can be much more efficient than two-way calling. Lucent Technologies studies show that voice messages average 30 seconds whereas two-way calls run much longer and are devoted to business only 50 percent of the time.

The Lucent Technologies voice messaging solutions include:

- DEFINITY AUDIX
- INTUITY AUDIX

Voice Response solutions include:

- CONVERSANT Voice Information System
- CONVERSANT Intro
- CONVERSANT Form Filler Plus

Integrating each of these products with your DEFINITY ECS measurably reduces overhead costs and improves efficiency — while ensuring that important calls aren't lost.

NOTE:
Some applications and products are unavailable in some countries. Please check with your local distributor for further information about which features and applications are available to you.

DEFINITY AUDIX Voice Messaging System

While many voice messaging systems require separate equipment and connections, the DEFINITY AUDIX System easily installs directly into your DEFINITY ECS cabinet to support advanced voice messaging capabilities without the need for an adjunct processor.

The DEFINITY AUDIX system gives small- to medium-sized businesses full voice messaging performance in a streamlined, cost-effective package. The result is high-performance voice messaging no matter what your business size.

Each DEFINITY AUDIX system supports up to 2000 mailboxes and stores up to 100 hours of recorded messages. It can be configured with 2 to16 ports (in two-port increments).

The system includes such features as multiple personal greetings, full-functioned automated attendants, outcalling for message notification, and multiple language support. The DEFINITY AUDIX System includes both analog and proprietary digital networking software, which allows it to exchange voice messages, subscriber profiles, and message status information with other voice messaging systems.

By embedding the voice messaging system within the DEFINITY ECS, the DEFINITY AUDIX system provides the following advantages:

- Because it is integrated within the switch, separate review and approval by government agencies for compliance with electrical requirements and other technical specifications often are not required.
- Connecting to the DEFINITY Communications System backplane provides direct access to switch interfaces such as time slots, signalling mechanisms, and power feeds.
- Bypassing analog ports and digital conversions provides a more efficient, higher quality call storage process.
- Using the same terminal with look-alike screens to administer both the switch and the DEFINITY AUDIX allows faster training and better performance.
- You can use DEFINITY ECS's maintenance strategy with DEFINITY AUDIX to allow remote maintenance by the same team that maintains the switch.

The entire system is contained on circuit cards, occupying five consecutive slots in a switch carrier. All the major components are economically mounted onto the multifunction board using the latest technology in large scale integration circuit chips and in surface mount fabrication. The components mounted on the board include the central processing unit, the small computer system interface unit that supports the tape drive and hard disk, the digital signal processor complexes that do speech processing, and the time slot interfaces for the switch.

In addition, an alarm board monitors the system power and environmental conditions, holds the disk drive, and includes a built-in modem for remote maintenance. The DEFINITY AUDIX System operates by emulating a switch digital port board.

Reliability and Security

In keeping with its commitment to assist clients in combating toll fraud, Lucent also designed the DEFINITY AUDIX System with security precautions against fraudulent access attempts. For example, the system only allows a transfer of calls to other voice mail subscribers. When a caller reaches the system and requests a transfer out, the system first checks the requested extension number against its subscriber database. If the extension number is not in the database, the transfer attempt is denied. Additionally, mailbox passwords can contain as many as 15 digits.

The alarm board on the DEFINITY AUDIX system has its own processor that allows maintenance and diagnostic access if the main processor fails. A liquid crystal display on the unit lets on-site technicians check system status. There also is a robust set of built-in diagnostics that technicians can access either on-site or remotely through a built-in modem. A special alarm-originating feature helps speed problem diagnosing and correction.

The system routinely performs self diagnostics. If it detects a problem. it automatically dials a Technical Service Center and produces a detailed alarm message with diagnostic specifics. The Technical Service Center staff responds quickly via the built-in modem to perform further diagnostics, isolate the problem. and take corrective action. As a back-up, the DEFINITY AUDIX system can send an alarm message to the switch.

Easy Installation and Expansion

The DEFINITY AUDIX System was designed for easy installation. There are no special power or cabling adjustments required. In fact, the system is as easy to install as a DEFINITY System circuit pack.

System expansion is simple. All the hardware required for the full 16 ports is included in the initial DEFINITY AUDIX system. If you decide to buy fewer than 16 ports initially, you can order additional ports at any time. Lucent Technologies can then activate those additional ports. There is no need to modify the basic hardware, and the system still occupies only five slots.

Improved Clarity

A speech processing algorithm developed at Bell Laboratories encodes at 16 Kbps, giving the DEFINITY AUDIX system a major advantage over its competitors in that it can store many more messages in a smaller space.

The algorithm also improves the speech quality in system prompts, users' personalized greetings, and the voice messages themselves. Bell Laboratories listening studies show that the message playback clarity is unsurpassed in the voice messaging industry.

Enhanced speed-up/slow-down of message playback is now offered because of this new algorithm. DEFINITY AUDIX System users can play back messages twice as fast or at half speed with no distortion in pitch.

The Best Solution Worldwide

Lucent Technologies offers the DEFINITY AUDIX System in the same countries as the DEFINITY ECS. Prompts are available in several languages. (Contact your local representative for information on available languages). Lucent Technologies will continue to develop a wide variety of languages and bilingual capabilities. Contact you account representative for the latest options.

The DEFINITY AUDIX System is the best voice messaging solution for international companies because it is integrated in the DEFINITY ECS. Because it does not constitute a separate piece of equipment, review and approval by government agencies are often not required.

Summary of DEFINITY AUDIX Features

DEFINITY AUDIX is a powerful voice mail system that enables you to create, store, send, and receive spoken messages electronically. Spoken prompts guide you as you enter simple one- or two-key commands at a touch-tone telephone. Subscribers can use the system 24 hours a day, sending and retrieving messages from any touch-tone telephone. And the AUDIX system helps to protect sensitive information by requiring users to enter a combination of subscriber login codes and passwords to access the system.

Whenever you call the DEFINITY AUDIX system, you interact with it by entering commands through your telephone's touch-tone keypad. You simply specify the desired activity, and follow the voice prompts for the desired task.

Special voice-processing features include Voice Mail, Call Answering, Outcalling, Multi-Level Automated Attendant, and Bulletin Board. The following is a summary of DEFINITY AUDIX capabilities:

- *Shared Extensions* provide personal mailboxes for each person sharing a phone.
- *Multiple Personal Greetings* allows you to prepare a pool of up to nine personal greetings to save time and provide more personal customer service. Separate messages can indicate you are on the phone, away from the desk, on vacation, etc. You can assign different messages to internal, external, or after-hours calls.
- *Priority Messaging* places important messages ahead of others.
- *Outcalling* automatically dials a prearranged phone number or pager when you have messages in your voice mailbox.
- *Priority Outcalling* automatically dials a prearranged phone number or pager when you have *priority* messages in your voice mailbox.
- *Broadcasting* allows you to send a single message to multiple recipients or to all users on the system.
- *System Broadcast* allows you to send broadcast messages as regular voice messages, or as messages that recipients hear as they log in.
- *AUDIX Directory,* allows you to look-up the extension number of any other user by simply entering their name on the telephone keypad.
- *Personal Directory* allows you to create a list of nicknames for quick access to telephone numbers.
- *Call Answering for Nonresident Subscribers* provides voice mailboxes for users who do not have an extension number on the DEFINITY ECS.
- *Full Mailbox Answer Mode* informs callers whenever messages cannot be left because there is no room in a subscriber's mailbox.
- *Name Record by Subscriber* lets you record your own name on the system.

- *Automatic Message Scan* can play all new messages in part or in their entirety without requiring you to press additional buttons, which is particularly useful when you are getting messages from your mobile phone.
- *Sending Restrictions by Community* enables you to limit the communities of callers who can communicate via AUDIX Voice Messaging.
- *Group Lists* allows you to create mailing lists of up to 250 people to use for broadcasting messages.
- *Message Forwarding* allows you to forward messages with or without attached comments.
- *Name Addressing* allows you to address massages by name if you don't know the extension.
- *Private Messaging* is a special coding feature that prevents recipients from forwarding messages.
- *Leave Word Calling* allows you to simply press a button on your telephone in order to leave a standard *call me* message on any extension.
- *On-Line Help* provides you with instant access to voiced instructions at any time when you are using the system.

INTUITY Messaging Solutions

Lucent Technologies INTUITY Messaging Solutions allows you to record, distribute, and receive messages in various mediums. The system runs on a MAP5P, MAP/40, MAP/40s, or MAP/100 computer connected to the switch and can accommodate up to 64 voice ports and 1255 hours of stored messages.

INTUITY also accommodates the Mode Code analog interface, which allows the system to communicate with the DEFINITY ECS without a separate data link. This interface also enables other vendor equipment to integrate with DEFINITY ECS. (Some INTUITY features may behave differently when you use the Mode Code interface. See the INTUITY documentation for more information.)

INTUITY Messaging Solutions essentially offers the same user features as the DEFINITY AUDIX System, plus the following features:

- *Fax Messaging* allows you to handle faxes as easily as you handle voice mail. You can send, receive, store, scan, delete, skip, or forward faxes. This feature is fully integrated with voice messaging, so you can attach faxes to voice messages, for example. You can also create special mailboxes for each of your fax machines. These mailboxes accept fax telephone calls when the fax machine is busy and then deliver the fax to the fax machine when the fax machine is available.
- *Turn off AUDIX Call Answering* allows you to turn off call answering in order to conserve system resources. You can create a message that tells callers they cannot leave a message, giving them another number to call, for example.

- *Pre-Addressing* allows you to address a message before recording it.
- *Integrated Messaging* allows you access and manage incoming voice, fax, and e-mail messages and file attachments from your personal computer or your telephone. A voice message will thus appear in your e-mail mailbox, for example, and vice versa. You can also set options to have just the message headers appear in the alternate mailbox. You can also create a voice or fax message by telephone and send it to an e-mail recipient.
- *Text-to-Speech* allows you listen to a voice rendering of text messages sent from a supported e-mail system and/or Message Manager.
- *Print Text* allows you to print messages sent from a supported e-mail system and/or Message Manager.
- *Enhanced Addressing* allows you to send a message to up to 1500 recipients.
- *Transfer Restrictions* allow you to control toll fraud by restricting transfers going through the voice messaging system.

INTUITY Lodging

INTUITY Lodging is a voice messaging system tailor-made for the hospitality industry. The system is described in Chapter 5, "Hospitality Solutions".

INTUITY Message Manager

The INTUITY Message Manager provides access to INTUITY AUDIX voice processing features on a personal computer connected to a local area network (LAN). It also works with DEFINITY AUDIX. This feature requires three distinct components to operate:

- The *AUDIX server software* is purchasable with the INTUITY AUDIX System as an INTUITY Message Manager Right-to-Use. Also, this feature has INTUITY AUDIX hardware requirements (see *Requirements).*
- The *Message Manager software* diskettes are separately purchasable and are installed either on each user's PC or on a LAN server.
- The *local area network* is wholly owned and maintained by the customer and must meet certain requirements for the INTUITY Message Manager feature to work.

Message processing features available at a subscriber's PC with INTUITY Message Manager include:

- Looking at up to sixteen message headers at a time and listening to messages in the order you choose. For subscribers who get many messages, this provides an easy way to view and prioritize the messages.

- Ability to send and receive fax-only or voice-fax messages, to view faxes on your PC, and optionally to print faxes.
- Recording, addressing, and scheduling messages.
- Replying to messages and forwarding messages.
- Annotating messages with a short subject line.
- Setting up AUDIX mailing lists on-line with easy text entry and editing. You can see the lists on-line and print lists on any local or network printer.
- Setting up personal greetings, multiple personal greetings, or multilingual greetings on-line makes it easier for you to manage and maintain your greetings, and annotating your greetings helps jog your memory.
- Browsing the subscriber directory.
- Administering Outcalling notification on-line with easy text entry and editing.
- Storing (archiving) voice messages on your PC for a permanent record of voice mail when needed.

Voice Messaging Systems and Call Coverage

The DEFINITY and INTUITY AUDIX systems can be set up as the last points on a coverage path. Calls are then redirected to AUDIX if they are not answered by a previous station on the path. In addition, a secretary or messaging agent who answers a call can transfer a caller to the AUDIX system “mailbox” of the original called party upon request. The caller may prefer to leave a voice mail message if the message is personal, lengthy, or highly technical.

Many other options are available for maximum flexibility. For example, a caller can choose to transfer from the system to an attendant or operator. Or the caller can transfer to another extension instead of leaving a message. Your company can choose to have an automated attendant answer calls to the company and direct calls to the right department quickly, so callers don’t have to wait on hold. With automated attendant, callers can be instructed to enter keypad commands to direct the call to the appropriate point. This gives customers choice and control. It also allows you to make the most effective use of your personnel, while still providing your customers with the service they expect.

INTUITY CONVERSANT System

The INTUITY CONVERSANT Voice Information System is an interactive voice-response system that automates phone-call transactions from simple tasks like routing to the right department to complex tasks such as registering college students or providing bank balances. It communicates with customers in natural-sounding, digitally recorded speech. And it performs — 24 hours a day and without the services of an operator.

The system can handle single or multiple voice-response applications simultaneously, and can serve up to 48 callers at once. It can operate by itself to dispense information or collect data, or it can work with a host computer to access a large database such as bank account records. With its speech-recognition capability, even rotary telephone users can have access to sophisticated phone-based services. Advanced telephone features provide intelligent call-transfer capabilities and allow you to use the system in your existing telephone environment.

The system's speech-recognition feature offers speaker-independent recognition of strings of digits and a standard vocabulary consisting of the digits 0 through 9, "oh," "yes," and "no." With speaker-independent speech recognition, the system understands virtually any caller speaking American English. This differs from speaker-dependent recognition, which understands only one particular speaker.

INTUITY CONVERSANT Voice Information System also supports a text-to-speech option, a leading-edge technology developed by AT&T and Lucent Technologies. Text-to-speech uses computer-generated synthesized speech to help you automate applications that were previously impractical to implement with pre-recorded digitized speech. It is particularly useful for applications that require access to large-volume databases or for applications that access information that frequently changes. The feature has built-in intelligence that enables it to:

- Read abbreviations accurately. For example, "Dr." is spoken as "doctor" or "drive," depending on the context in which it occurs.
- Read numbers accurately. For example, the ZIP code, "11423," would be read, "One-one-four-two-three," and not as, "Eleven thousand four hundred twenty three."

You can also create new applications for the system by using the optional, easy-to-use CONVERSANT Script Builder, a menu-driven application development software package that gives you the tools to create a custom voice-response application.

INTUITY CONVERSANT Voice Information System is installed on the MAP/100 platform, which provides support for many advanced features, such as speech recognition, text-to-speech, and ISDN capability.

INTUITY CONVERSANT Voice Information System interfaces to a variety of host systems, either asynchronously or synchronously. A CallVisor Adjunct Switch Applications Interface connection to DEFINITY ECS is available via a Basic Rate Interface card. This enables the switch and the Voice Information System to exchange data and control signals so the Voice Information System can assist in call handling. Also available are Ethernet Local Area Network interfaces using both twisted pair and coaxial cable.

INTUITY CONVERSANT Voice Information System is a wide-ranging, flexible product, ready to solve your needs for interactive voice-response services.

CONVERSANT Form Filler Plus

The versatile Form Filler Plus applications package for the CONVERSANT System lets you efficiently create a system that converts a caller's spoken responses to scripted prompts into usable data. Possible uses include orders placed verbally to an incoming call center, market survey responses, time and sales reports, and benefit claims.

The system records responses to as many as 10 prompts per call and delivers them on demand to a transcriber with a standardized, form-based screen for easy, error-free data entry. There's even room for remarks to supervisors and co-workers.

The prompts are easy to use. Initially, the caller is asked to select from a menu of products or services. Then the caller hears a series of voice prompts, such as "speak your name now" and "say the quantity you want now."

Safeguards are built in to ensure the caller is satisfied. After each prompt, the caller is given time to respond. If a mistake occurs, the system politely prompts you again. The caller also can listen to and rerecord the responses. At any time, the caller can reach a live attendant.

Individual prompts can be programmed to vary by time or day. In a service application, for example, callers in the morning can be prompted to select from rush or standard on-site help. In the late afternoon, the selection could be changed to night or next morning service. On weekends, there still could be another set of options. Call volume reports are readily available for any period.

The Form Filler Plus package comes with complete documentation, including a sample application used as a template for fast implementation via the easy-to-use Script Builder tool. Scripts can be revised on line; individual prompts can be changed without changing the entire transcription screen.

Desktop Solutions

10

The communications needs of the people in your company may vary widely. Some may need only basic telephone service. Others may need effective messaging services to save valuable time. Still others may require high speed data communications and access to a variety of host and personal computers.

DEFINITY ECS brings voice communications, data communications, visual communications, and messaging together on the desktop, and lets you customize types of service for various individuals.

NOTE:
Some applications and products are unavailable in some countries. Please check with your local distributor for further information about which features and applications are available to you.

Telephone Features

With DEFINITY ECS, the employees in your company can easily place a simple telephone call while still having access to powerful features. These features range from the basics (such as Call Forwarding, Hold, Transfer, and Conference) to more sophisticated features intended for particular situations or users.

These features can be accessed in a variety of ways. For example, some can be accessed by pressing a fixed-feature button on the telephone. Many others can be accessed by dialing an access code or by pressing a programmed button on the telephone. Here are just a few examples of how particular telephone features can help your employees to handle calls more efficiently.

Abbreviated Dialing

Allows you to dial frequently called or emergency numbers with just a few button presses instead of dialing the entire number one digit at a time. You can use Abbreviated Dialing to dial both internal and external numbers of up to 36 digits. Many telephones also allow you to program abbreviated dialing buttons so you can dial frequently dialed numbers with just one button press.

Bridged Call Appearance

Allows you to assign one extension to more than one telephone. In this way you can handle someone else's calls from your own telephone. Primarily useful for secretaries and administrative assistants, this feature allows you to originate, answer, or bridge onto calls without transferring. The maximum number of telephones using the same extension has just been increased from 16 to 26.

Conference

Allows you to set up a conference call with up to six people. Anyone in the world with access to a telephone can participate in your conference. The Conference button on your telephone allows you to set up the conference call without the aid of an attendant.

Display of ISDN/PPM Charge

In some countries, the public network is able to send the cost of a call to the DEFINITY ECS while a call is in progress, using either Periodic Pulse Metering (PPM) or the ISDN Advice of Charge feature. In these countries, if you have a Lucent Technologies DCP or BRI telephone, DEFINITY ECS allows you to see the ongoing cost of your outgoing call on your telephone display while the call is in progress. This can help you save money by keeping expensive calls relatively short. See your local representative for more information on what call charge information can be obtained in your area.

Group Listen

Simultaneously activates your speakerphone in listen only mode and your handset or headset in listen and speak mode. This allows you to serve as spokesperson for a group. You can participate in a conversation while everyone else in the room is listening to what is said.

Group Paging

Group Paging allows you to make immediate announcements to groups of people via their speakerphones. The announcements are one way (speak only for you, listen-only for the recipients), and automatically turn on each station's

speakerphone. The announcement appears on each telephone as a normal call. Recipients can pick up the handset to listen, but cannot respond. The announcement does not go to telephones that are being used. If all phones are being used, you (the sender) hear a busy signal.

Integrated Announcements

DEFINITY ECS allows you to store recorded announcements (messages) internally within the switch. The announcements are digitized and stored in state-of-the-art electronic memory devices. DEFINITY's integrated announcements are:

- Easy to use. Announcements can be recorded and updated from any telephone. And all announcement configuration is performed from the Management Terminal.
- Reliable. Even a power failure will not affect the integrity of your announcements. Because the announcements are stored digitally, voice quality does not degrade over time. There are no external boxes, messy cabling, or separate power supplies. And there are no tapes to jam or break.
- Flexible. Since the announcements are integrated within DEFINITY, the applications are almost endless. Announcements can be played to callers waiting for connection. They can be inserted into coverage paths to give out your hours of business. DEFINITY applications like vectoring were designed to take advantage of the power of integrated announcements.
- Ideal for a global market. Since you record your own announcements, any language can be provided — even multiple languages on the same switch. For example, your hotel guests can receive wakeup greetings in their native language.
- Easily expandable. In larger DEFINITY configurations, if you need more announcement recording time, you can simply plug in another DEFINITY Announcement circuit pack.

Integrated Directory

Either through voice messaging or a display telephone, the system allows you to access the switch directory and retrieve an extension number. The directory contains an alphanumeric listing of all names and extension numbers connected to the system. The directory can be set up using several languages. (Contact your local distributor for a complete list of languages.)

Last Number Dialed

Allows you to redial your last call, whether it is an internal or an external call. You can press a single button to redial a number of up to 20 digits.

Leave Word Calling

Allows you, with the touch of a button, to leave a standard message (“Call me back,” for example) for others on the same switch.

Whisper Page

Allows an assistant or colleague to bridge onto your telephone conversation and give you a message without being heard by the other party or parties you are talking to.

Call Coverage

The Call Coverage feature ensures that your calls are always answered and that callers rarely, if ever, receive a busy signal. Call Coverage is so flexible that external calls can be routed to one group of attendants and internal calls to an entirely different group.

In some respects, Call Coverage serves as a versatile secretary who screens your calls. It automatically redirects calls to other telephones and messaging services, allowing you to delegate or defer calls as needed.

You can redirect calls according to five status conditions: Active, Busy, Don’t Answer, Cover All, and Send All Calls. If you are using one telephone line, the system considers you “active.” If you are using all your available lines, the system considers you “busy.” If the call goes unanswered, the status is “don’t answer.” Sometimes you might need to assign a secretary or other colleague to “cover all calls,” or you may “send all calls” to a permanent voice messaging system or an assistant.

Call Coverage lets you redirect calls to suit any or all of these criteria. For each telephone, you can have up to four coverage paths. A path is a set of alternate extensions that a call can be sequentially transferred to. Each path can be composed of as many as six extensions, arranged in order of preference. A redirected call immediately goes to the first choice extension. If the first choice is not available, the system tries the second choice and then the third choice, if necessary.

Many people prefer to redirect all of their calls to the same answering points under all conditions, and need only one coverage path. If a secretary is available to cover all calls, even if you are available, the other criteria can be ignored. If you prefer to answer your own calls, however, you will probably require Busy, Don’t Answer, and Send All Calls coverage. Send All Calls lets you redirect your calls by pressing a single button or dialing an access code.

Time-of-Day call coverage allows you to redirect calls to different lead-coverage paths at different times of the day and on different days of the week.

For example, you may want to be available in the evening hours during a special project. You might also want calls directed to the office during the day, and have all other calls directed to AUDIX. By specifying the appropriate lead-coverage paths, you can have the call redirection flexibility you need.

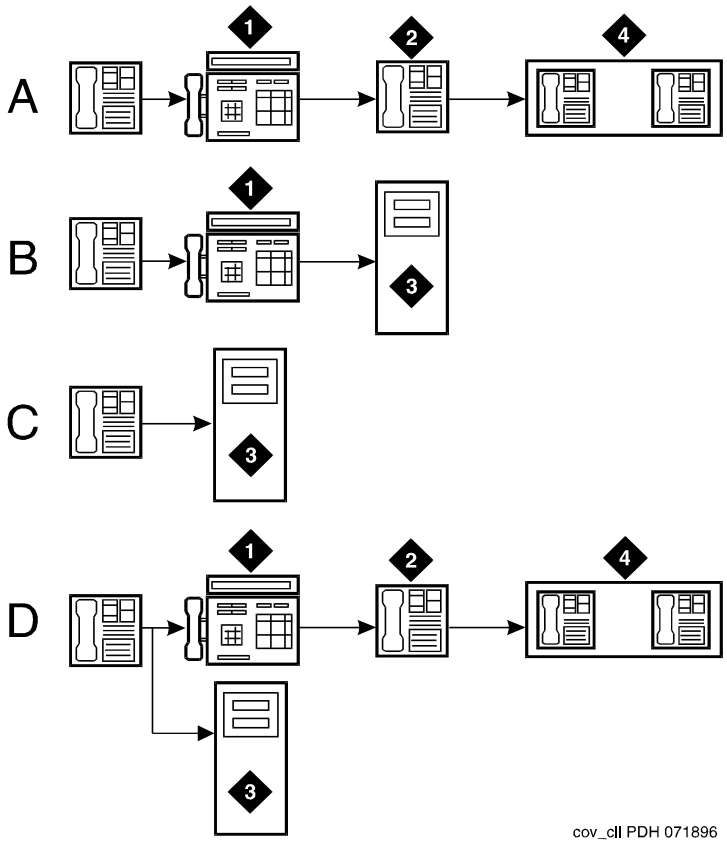
Telecommuting enhancements allow you to have call coverage redirected to a remote site. This is useful if you have a home office to which you want calls sent. For more information on remote call coverage/forwarding, see Chapter 7, "Telecommuting Solutions".

Coverage Paths for a Manager

Figure 10-1 shows four coverage paths you might need as a manager. The example assumes you:

- Receive many external calls
- Share a secretary with two other managers
- Prefer to answer your own calls when available
- Travel frequently

External calls are important because they are usually from customers and require personal attention as they arrive. Internal calls are also important, but often need not be dealt with immediately by you or an assistant. In either case, Send All Calls is useful because it allows you to redirect all calls immediately when you are not available. This saves the caller the annoyance of waiting for several rings before being able to talk to someone or leave a message. The Call Coverage arrangement shown works well for many managers. Note that the same coverage path is used for all external calls because these calls need special attention even when you are unavailable.



A)	External Calls: Active, Busy, Don't Answer	1)	Secretary
B)	Internal Calls: Cover All	2)	Clerk
C)	Internal Calls: Active, Busy, Don't Answer	3)	AUDIX Voice Messaging
D)	Internal Calls: Send All Calls	4)	Message Center Group

Figure 10-1. Typical DEFINITY ECS Call Coverage Options

Voice Messaging and Call Coverage

Often an AUDIX system is set up as the last point on a call-coverage path, as in Figure 10-1 above. A secretary or colleague who answers a redirected call intended for you can also transfer the caller to your AUDIX mailbox. The caller may prefer to leave voice-mail for you if the message is personal, lengthy, or technical.

Many other options are available. For example, a caller can redirect a call from the AUDIX system to an attendant. Or the caller can transfer to another extension instead of leaving a message. You can even have the AUDIX automated attendant answer all calls to the company and send calls to various extensions. In this case, callers are instructed to enter keypad commands to direct the call.

Message-Retrieval Options

With the message-waiting lamp on their telephones, employees always know when they have messages. Messages can be retrieved in a variety of ways, such as:

- Display retrieval — Users having digital telephones with displays or a personal computer integrated with a telephone can display messages.
- Speak-to-Me — Using any touch-tone telephone, employees can dial Speak-to-Me and hear a synthesized voice read their messages over the phone.

These message-retrieval options can be assigned to users individually.

Telephones and Workstations

A wide variety of telephones are available with DEFINITY ECS, ranging from basic single-line telephones to sophisticated workstations that integrate voice data, image, and video communications. Your DEFINITY ECS configuration might incorporate a mixture of terminal types based on the various users' job functions. DEFINITY ECS telephones and workstations are easy to use and attractive while giving you the ability to tap into the power of the DEFINITY ECS system.

Telephones

DEFINITY ECS telephones fall into three basic families — analog, Digital Communications Protocol, and BRI. These terms describe how each type of telephone communicates with the DEFINITY ECS switch. These families of telephones are designed to accommodate the types of communications various users require. All telephones have touch-tone dialing and the message-waiting lamp for notification of messages.

Analog (Single-Line) Telephones

Single-line telephones are an economical choice for users who do not handle many calls and do not use modems and fax machines extensively.

All signals between analog telephones and the DEFINITY ECS switch are in analog form over a pair of wires. Only one incoming call can ring at a time, but the telephone can actually handle two calls — one active and one on hold. Depending on the particular telephone, you can alternate between two calls or set up a

three-way conference using the switchhook or flash button. You can access DEFINITY ECS voice features by either entering access codes from your touch-tone keypad or pressing feature buttons. Several models of analog telephones are available.

DCP Telephones

Digital DCP telephones using the Digital Communications Protocol employ digital transmission for integrated voice and data signals and control signals. Transmission is over a connection consisting of one or two two pairs of wires. Each connection supports one signalling channel and two information (voice and data) channels.

DCP telephones are used most effectively by those who have a high volume of calls, require access to multiple applications or databases, use switch features heavily, or require messaging services. These telephones can be used with personal computers to expand their capabilities.

These telephones provide the full range of DEFINITY ECS features on your desktop. In addition to multiline and multifunction capabilities, they provide access to integrated voice and data applications and messaging services. Some models include displays. DCP telephones can actually save you money by reducing the number of lines, modems, and ports that would normally be needed for analog facilities.

ISDN BRI Telephones

Like the digital DCP telephones, ISDN telephones transmit voice, data, and control signals digitally. With the ISDN telephones, however, the transmission employs the world-wide standard BRI protocol between the switch and the telephone.

Also like the DCP telephones, these telephones can be used with personal computers to expand their digital capabilities. DEFINITY ECS's family of ISDN telephones includes several models that have unique features such as call logs and personal directories.

Telephones for the Global Marketplace

With help from our many global customers, Lucent Technologies has developed the 8400, 9400, and 6400 series telephones to meet the demand for two-wire telephones in the global marketplace. The 6400 series telephones are the latest offering.

8400 Series Telephones

The 8400 digital telephones are versatile two-wire/four-wire Digital Communications Protocol (DCP) telephones with new styling that offer new flexibility and cost savings. They automatically detect whether they are plugged into a two-wire or

four-wire digital line circuit card. This is a significant benefit because it provides an easier transition to either a two-line or a four-line environment, therefore reducing wiring expenses and installation adjustments. It also allows you to save space inside the cabinet by using 16-port two-wire boards in place of 8-port four-wire boards.

In response to customers' requests, the handset has a larger mouthpiece, the telephone has raised buttons that provide improved tactile feel for easier use, and the finish is a scratch-resistant texture that preserves the telephone's appearance. Programmable speakers and microphones can be turned on or off by the system administrator.

There are six models of 8400 series telephones:

- 8403 — A three-line telephone without a display that can be wall mounted. This entry-level telephone is designed for users with basic call handling requirements. It is ideal for areas where there is minimum use, such as reception areas, copy rooms, file rooms, or warehouse locations. It has a built-in one-way (listen-only) speakerphone that facilitates off-hook dialing and listening to voice mail or broadcast messages. You can add a S201A speakerphone and use the inexpensive 8403 in a conference room.
- 8405B — A five-line telephone without a display that can be wall mounted. This telephone is for employees with call coverage responsibilities who need multiple line appearances and extensive features. It has a built-in two-way speakerphone and programmable keys so you can access more switch features from the telephone.
- 8405D — A five-line telephone with a display, otherwise virtually the same as the 8405B.
- 8410B — A ten-line telephone, otherwise virtually the same as the 8405B.
- 8410D — A ten-line telephone with a two-line, 24-character display. This telephone has the same features as the 8410B and can also be wall mounted.
- 8434DX — A thirty-four-button set with a 2-line by 40-character display. This telephone is for the busy executive or executive assistant where extensive call handling and call coverage flexibility are vital. The 8434DX has a built-in two-way speakerphone and programmable keys. A 24-button expansion module can be added.

Here are the most important features of the 8400 telephones:

Administering Speakerphones. You can administer speakerphones either through the switch or through the telephone. The 8410B, 8410D, and 8434DX telephones can be administered as two-way speakerphones or one-way listen-only speakers, or you can disable the speakers. The 8403 can be administered as a one-way listen-only speaker or the speaker can be disabled.

Compatibility and Investment Protection. The 8400 series digital telephones are compatible with all two-wire DEFINITY ECS systems and future system

releases, as well as with all earlier DEFINITY four-wire systems. The backward and forward compatibility of these telephones protects the investment you made in your existing wiring and your existing older version four-wire DEFINITY systems.

International Icons and Languages. International icons are used on the telephones, and buttons are available in several languages, as are the messages on display sets. You can also use a user-defined table to customize the translations. Additional international portability is provided with downloadable handset transmission parameters.

Tripled Capacity. When the 8400 series telephones are coupled with the new two-wire 24-port Digital Line Circuit Card, you benefit by having more capacity in each carrier. Therefore purchase of additional carriers or cabinets may not be necessary.

9400 Series Telephones

The 9400 digital telephones, also known as Europhones, provide inexpensive support for two-wire installations, while still providing a European design (Figure 10-2). Three models of the 9400 telephones are available in gray and cream white. The 9403, 9410B, 9410D, and 9434 telephones are similar in design and features to the 8400 series.

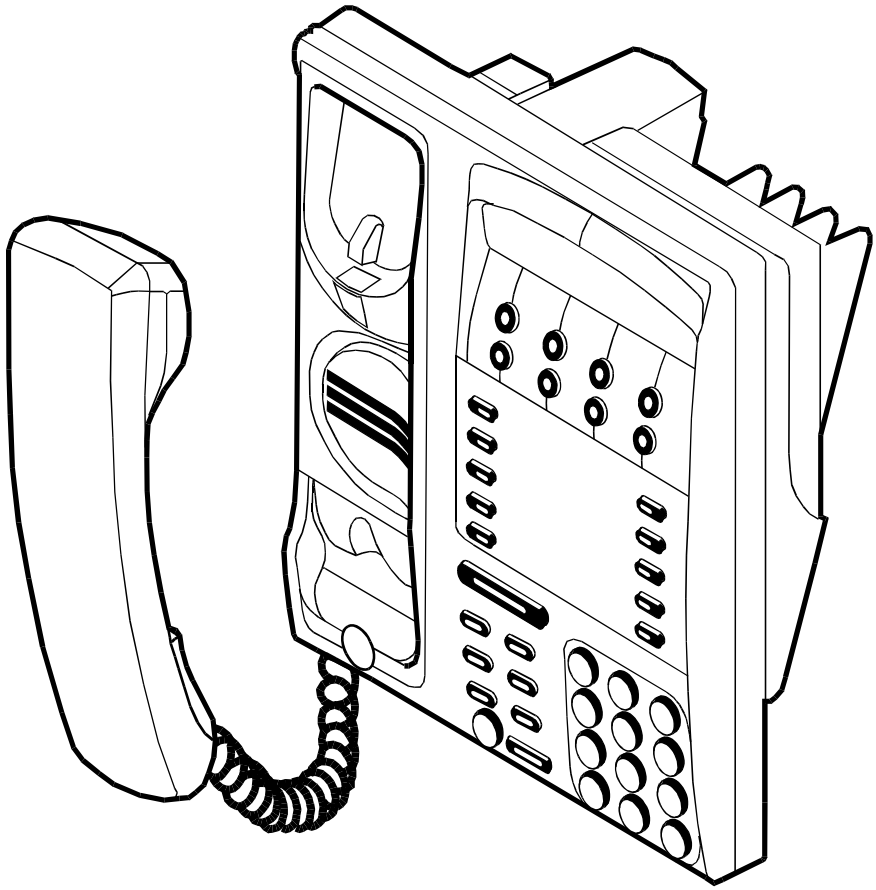


Figure 10-2. 9400 Series Telephone

Here are the most important features of the 9400 telephones:

International Language Support. The new 9400 digital telephones are available with labels and user's guides in several languages. Because the European requirements for the lettering on the keypad are not identical, Lucent Technologies has created an overlay that holds the necessary lettering for each country. Two overlays are available: one blank and one with letters, complying with CCITT standards.

Compatibility. Like the 8400 telephones, the 9400 telephones are compatible with all DEFINITY 2-wire installations. The connection is made via a two-wire, 16-port DCP interface card.

Solid Engineering. Compliance with the most rigid emission and electromagnetic requirements ensures the integrity of your installation.

6400 Series Telephones

The 2-wire, DCP 6400 digital telephones are similar to the 8400 and 9400 telephones, and feature new styling and a pullout instruction card. The 6400 telephones also include the following additional features:

- Date and time display.
- A feature button which allows switchhook control of a headset.
- *Group Listen* capability, which allows you to use your handset or headset normally while others in the room listen in via speakerphone. This 2-way handset, 1-way speaker mode allows you to serve as a spokesperson for a group.
- *Telephone Self Administration* capability, which allows you to program feature buttons on the telephone yourself.

Teleconferencing Products

How much of your business time do you spend in meetings — or traveling across the building, across town, or across hundreds of miles to get to a meeting? How often was time lost because vital information was left in someone's office? Meeting by phone or teleconferencing offers an attractive alternative. Meetings are suddenly more convenient, easier to schedule, and travel expenses are greatly reduced. The Lucent Technologies Quorum and Soundstation products provide you with all the benefits of voice conferencing.

Quorum A-28 Conference Bridge

The Quorum A-28 Conference Bridge is a microprocessor-controlled analog bridge. It allows you to activate a multipoint connection of switched and private-line circuits to create a single conversation. You can set up, monitor, and control your own teleconferences through your DEFINITY ECS.

You can set up and supervise the bridge connections through an attendant console. Participants can dial into a prearranged conference at a specified time. The calls are then connected automatically, or can be screened by the attendant before being added to the conference. The attendant can also monitor the transmission quality of any or all of the active conference links. Poor connections can be identified, isolated, and re-dialed without interrupting the rest of the conference.

The bridge design ensures optimum sound clarity on the conference no matter how many participants are connected or where they are located. The bridge circuitry senses any differences in signal strength and electronically balances voice levels. It also filters any extraneous noises that could interfere with the conference.

The Quorum A-28 Conference Bridge allows you to connect up to 28 different people on a single conference call. Or you can set up multiple conferences — up to four conferences with seven participants each.

The bridge also provides a lecture mode that you can use for one-way broadcasts. Using the Mute feature, participants can be placed in a listen-only mode, allowing one speaker to address the rest of the conference.

SoundStation Audioconferencing Systems

Lucent Technologies's SoundStation and SoundStation EX Audioconferencing Systems enable a group of people in a conference room to share their conversation with others through a telephone connection. The Soundstation equipment permits natural conversation among many people — whether strong or soft, or from a standing or sitting position. Integrated components and a stylish tripod design make the console an attractive yet unobtrusive conference table centerpiece (Figure 10-3).

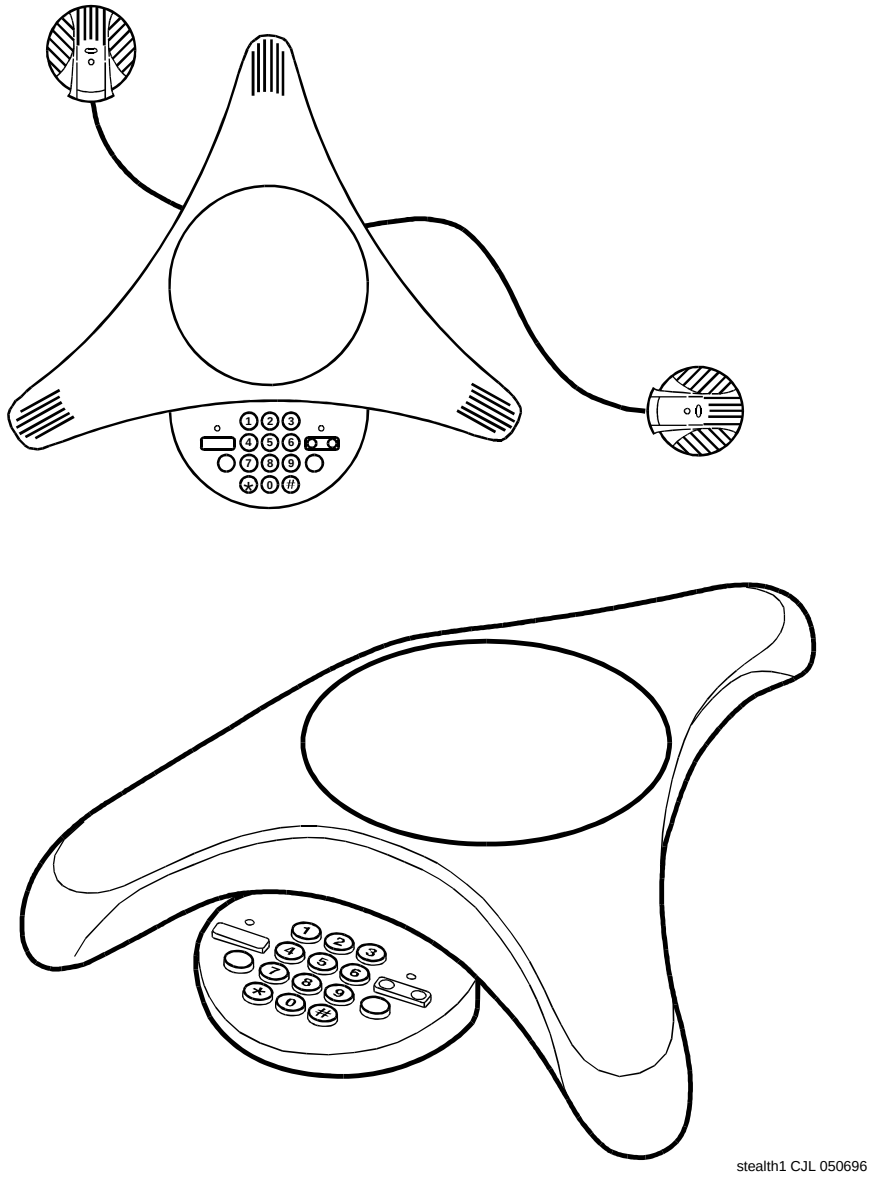


Figure 10-3. Soundstation EX with External Microphones

The equipment's full-duplex technology allows conferees to speak at the same time, thus eliminating the tendency conventional speakerphones have of *clipping* — failing to transmit the beginning or ending sounds made in conversation. The SoundStation systems adapt automatically to changing room and telephone line conditions to permit natural, two-way conversations without distortion. This allows you to be heard without straining to hear what others are saying.

SoundStation

The SoundStation has three microphones and a digitally tuned speaker that provide 360-degree coverage, whether you use the system in an office or a conference room. It connects to an analog telephone line. The built-in keypad includes a mute button and a flash key. An additional port allows you to connect the speakerphone to a tape recorder.

The system is simple to install and use. You plug the phone line into a small wall module plugged into an outlet. A single cable from the wall module to the console reduces tabletop clutter. The console works like a normal telephone.

SoundStation EX

The SoundStation EX includes all the features and functions of the SoundStation. It accommodates larger conferences by including two palm-size external microphones that can be positioned up to six feet (1.8 m) on either side of the center console. An optional wireless microphone is available for stand-up presenters.

Multimedia Solutions

11

Multimedia complex

The multimedia complex is the solution to handling the following calls:

- Multimedia calls
- Conference calls
- Voice-Only calls

The multimedia complex is built from:

- A multimedia-equipped BRI-connected PC
- A non-BRI multi-function telephone

From the multimedia station, a user can:

- Place and receive voice or multimedia calls
- Place calls on hold
- Unite calls into voice or multimedia conferences
- Drop a voice call from a conference

The user controls calls and activates features via:

- Call appearance selection
- Feature button activation
- Feature access codes entered on the user's telephone dial buttons

High-Level feature description

The hardware required to create a multimedia station is connected together as a multimedia complex. A multimedia complex consists of the following:

- A monitor, keyboard, and PC
- A multi-function telephone

The members of the complex operate independently:

- Voice calls are sent to the voice station
- Multimedia calls are sent to the multimedia endpoint

If an incoming multimedia call is not answered by the multimedia endpoint, the call is converted to voice and sent to the voice endpoint. If the voice call is not answered there, it is sent to the coverage path of the voice station. Voice calls originate from the voice endpoint while multimedia calls originate from the multimedia endpoint. Multiple call appearances and multi-function operation are available only for voice calls (or multimedia calls converted to voice) at the voice station. This operation is termed the MMCH basic mode of operation.

The media streams supported are:

- Voice (audio)
- Video
- Data

Multimedia Call Handling

DEFINITY ECS enables you to administer two devices as a multimedia call complex. Composed of a voice terminal and a personal computer and/or data module, the complex handles both voice and video calls. Multimedia calls are treated in much the same manner as are voice calls. The user can:

- Forward calls
- Cover calls
- Hold calls
- Park calls

A multimedia complex is also useful for conducting video conferences. The service circuits that support MMCH are in multiple port networks and allow for increased simultaneous calls.

Multimedia call handling requires that the transmission endpoints comply with the ITU H.320 standard for visual telephone systems. Specifically, it has been tested with the following multimedia transmission equipment:

- PictureTel
- Proshare
- Vistium
- Zydacron

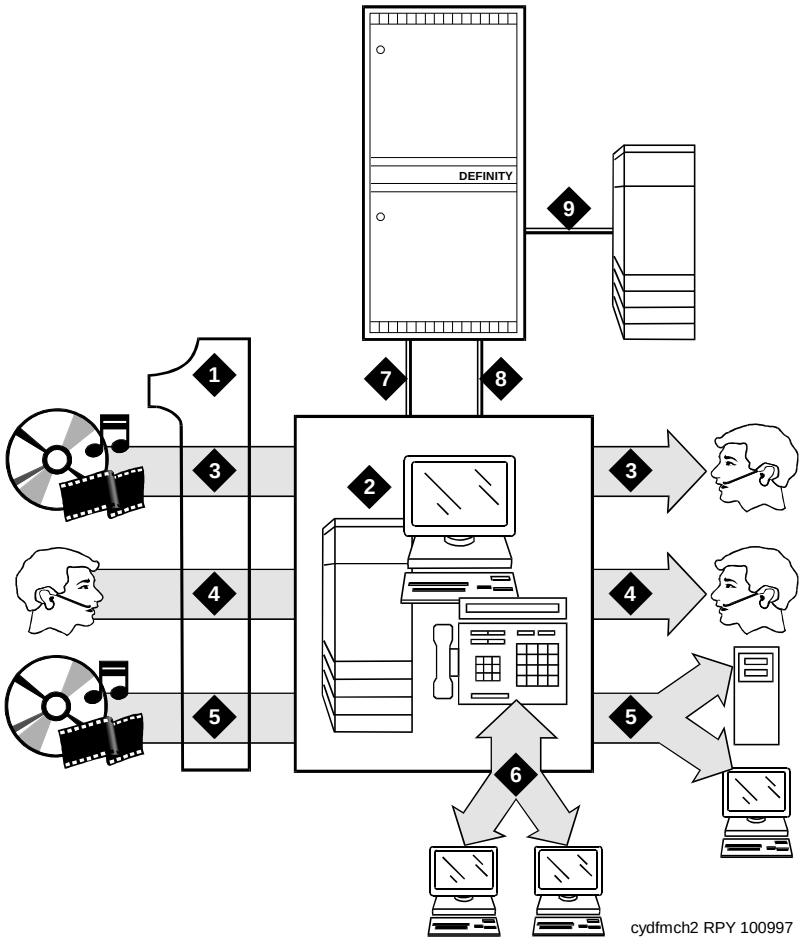
Multimedia call-handling features the following capabilities:

- One number access — Allows users to dial only one number to access the multimedia complex, regardless of the type of call. In MMCH, DEFINITY ECS recognizes whether the call is multimedia or voice, and routes it to the appropriate device in the complex — telephone or PC (or data module).
- Multimedia to voice conversion — If a multimedia call cannot be handled by the PC or data module in a multimedia complex for some reason, DEFINITY ECS converts it to a voice call and sends it to the telephone.
- Call redirection — Calls to the multimedia complex can be redirected to coverage (AUDIX Voice Messaging, for example) or forwarded. Multimedia calls sent to coverage are first converted to voice calls. Multimedia calls that are forwarded to telephones are also converted to voice calls. Multimedia calls that are forwarded to a multimedia station or complex are not converted to voice calls.
- Call-Me Conferencing — You can use the multimedia complex telephone to control multimedia conferences. All the conference participants must call the controlling telephone. The telephone must remain connected to the conference for the duration of the conference.
- Call association — The second call of a 2 B-channel call is automatically matched with the first call and routed to the same multimedia complex.

- Hunting — Multimedia endpoints can be part of a non-ACD hunt group.
- Authorization — Multimedia complexes are secured in the same way telephones on the DEFINITY ECS are. The authorizations are specified on the Class of Restriction and Class of Service forms.
- T.120 Data collaboration via the Expansion Services Module (ESM)[1] — Allows sharing of PC-based applications, shared white board (a virtual chalkboard), and file transfers.
- MM Call Early Answer — The early answer capability ensures that a caller has audio connectivity prior to connection of the answering party or an announcement.

Most of these features are illustrated in Figure 11-1.

1. ESM is a protocol recognition for data conferencing.



1) One number access
2) Multimedia call complex
3) Multimedia to voice conversion
4) Standard voice call handling
5) Call redirection
6) Multimedia conferencing
7) BRI data connection
8) DCP voice connection
9) ESM data collaboration

Figure 11-1. DEFINITY ECS Multimedia Call Handling

Multimedia Applications Server Interface

The Multimedia Applications Server Interface provides a link between the DEFINITY ECS and one or more Multimedia Communications Exchange nodes. A Multimedia Communications Exchange is a stand-alone multimedia call processor produced by Lucent Technologies. This new link to DEFINITY ECS enhances the capabilities of each Multimedia Communications Exchange system by enabling it to share some of the DEFINITY ECS features. In particular, the interface provides the following advantages:

- Call Detail Recording — The capture of call detail records so you can analyze the call patterns and usage of multimedia calls just as DEFINITY administrators analyze normal calls.
- Automatic Alternate Routing/Automatic Route Selection — The intelligent selection of the most cost-effective routing for calls, based on available resources and your carrier preference. The system may select public trunks via DEFINITY or Multi Media Communication Exchange.
- Voice Mail Integration — You can access your DEFINITY or INTUITY AUDIX voice messaging system from a Multimedia Communication Exchange.

Video Products and Services

Lucent Technologies video products and services provide creative alternatives to business as usual. Now you can conference and collaborate — across the country or around the world — via visual communications. You need go no further than the video conferencing room to take a class with Lucent Technologies distance learning solutions. When class is over, you're back at your office in a matter of minutes, ready to implement what you've learned.

Besides the obvious advantage of reduced travel expenses, video conferencing allows you to make quicker decisions, provides ready access to essential information, allows you to consult with specialists on an as-needed basis, and ultimately allows you to bring products to market faster.

Visual communications provides other advantages for your normal day-to-day operations. Business meetings can benefit from the nuances a facial expression can convey sometimes more directly than the words being spoken. Product prototypes can be demonstrated with ease. You can meet with your suppliers without travelling long distances.

This section will introduce you to the visual communication products that you can connect to your DEFINITY ECS to create a premier communications solution that satisfies all your needs — voice, data and video — just by dialing a telephone number. And for additional information on Lucent's visual solutions, contact your local distributor. If you are in North America, dial 1-800-VIDEOGO (prompt 3).

NOTE:
Some applications and products are unavailable in some countries. Please check with your local distributor for further information about which features and applications are available to you.

Group Video System

Lucent's Group Video System turns a telephone call into a face-to-face meeting for conducting business with people across the country or around the world. Lucent's line of Group Video Systems, based on the PictureTel Group Video Line (System 1000, 4000, Venue 2000™ and Concorde 4500™), is designed to assure that your video conferences are the most effective possible.

A Group Video System can connect directly to your DEFINITY ECS system or to the network at speeds from 112 Kbps up to 384 Kbps. When connected to your DEFINITY ECS via either Data Communication Protocol ports or a DS1 interface, video calls are placed as easily as voice calls. And you can benefit by using your DEFINITY ECS's World Class Routing capabilities and the shared use of network facilities such as ACCUNET Switched Digital Services or Software Defined Digital Network.

Group Video Systems are totally self-contained and include a pan/tilt/zoom camera, a monitor, the control unit, communications equipment, and the equipment electronics. You can easily add peripheral equipment such as video cassette recorders to record the conference, document scanners to review hard-copy material with distant participants, and personal computers to supply spreadsheets or other computer-based conveniences.

You can equip any office or conference room with a Group Video System. Conferees can speak and act naturally without thinking about audio and video pickup. Advanced video-compression technology ensures excellent picture quality across a variety of available speeds (112 to 768 Kbps). The system adapts automatically to room acoustics, and a unique, audio-compression algorithm yields distortion-free, full-duplex, interactive video without echo. A highly-sensitive microphone is built into the control unit, and if necessary, conferees can use up to four auxiliary desktop and/or lapel microphones.

You control the conference via a desktop keypad that easily turns the system on or off, dials the call, adjusts the audio volume, selects the video source, and positions the camera. The camera in most models has an auto-focus lens, plus zoom, pan, and tilt capabilities that let users move the camera to follow conferees as they move around the room. Optional capabilities include remote control of the far-end camera and camera presets that let conferees set up to eight camera positions — four local and four remote — each accessible at the touch of a button.

An automatic feature of most Group Video System models is the use of a window (picture in a picture) for previewing, so you can see what your camera sees as well as what the far-end camera sees. The window also permits simultaneous viewing of far-end video and still-image graphics.

Group Video Systems are available in a variety of models that can accommodate an office, small meeting room, or even a spacious boardroom. All models have colour monitors, with dual monitors available on most for simultaneous viewing of video and high-resolution still images. The systems available are:

- The System 1000 — Quality, inexpensive group video products:
  - Model 30 — For small group or individual meetings.
  - Model 50 — For medium to large group meetings.
- The Venue 2000 — A relatively inexpensive system with an enhanced user interface.
- The System 4000EX — The industry's most popular high performance systems:
  - Model 200 — The office system: modular, portable, and well-suited for small offices and conference rooms.
  - Model 200 — The cart system: a larger, portable system on wheels.
- The Concorde 4500 — A highly advanced system offering superior transmission quality and unparalleled ease-of-use.

Telephone add-on is an option on all models. This enables you to add a voice conferee to the video conference. Other options include security codes, freeze-frame graphics, and video cassette recording.

The monitors can accommodate both the U.S. National Television System Committee standard and PAL, the European 625-line standard, providing global compatibility for your visual communication needs.

Desktop Conferencing Systems

Many meetings involve just two or three individuals who need to share information — whether it be text, data, graphics, or some other form of information. And with larger teams of people, these individuals may be separated in locations around the country or the world. They have the same need to meet strategic objectives, shorten project cycle time, and improve working relationships with project partners. These needs can also be satisfied through visual communications.

To satisfy these requirements, integrated telephone and PC visual communications systems are available. These desktop conferencing systems use ISDN-BRI or two switched-56 line network facilities.

Monitors and cameras create a unique desktop environment that provides you and your business with the following benefits:

- Software application screens and data can be called up, shared, changed, and annotated by video conferees while they hold a video conference.
- Geographically separated people are brought together along with the data and information they need to share at the desktop.
- Major obstacles to creative collaboration and situations that are information-intensive are overcome.
- Desktop workers can communicate with others who are using desktop conferencing or the Lucent Technologies Group Video System.
- Desktop workers can communicate with other systems supporting the ITU-T H.320 standard.
- Your DEFINITY ECS system is converted into a solution for all your communication requirements — voice, data, and video.

MultiPoint Control Unit

When connecting more than two video endpoints, you can use the MultiPoint Control Unit to set up and conduct multipoint video conferences. This is a stand-alone unit that provides easy-to-use multi-location video conferencing.

The MultiPoint Control Unit can operate behind any DEFINITY Communications System or can be directly connected to the network. The MultiPoint Control Unit can support from 4 to 64 ports in four-port increments. Those ports can then be used to connect multiple video endpoints, either Group Video System or Desktop Conferencing Systems, in a multipoint conference. Group Video System can be linked at speeds from 56 Kbps to full T-1, while Desktop Conferencing Systems can be linked at speeds from 56 Kbps to 384 Kbps.

The MultiPoint Control Unit uses the ITU-T H.320 video conferencing standard to connect the video endpoints, assuring compatibility with other video endpoints that conform to the standard. In addition to compatibility, the H.320 standard ensures a common level of visual, graphics, and audio quality that will satisfy your visual communication requirements.

The unit is built on the architecture of the DEFINITY ECS. The MultiPoint Control Unit sits in its own carrier and takes up approximately the same space as a DEFINITY ECS single carrier cabinet. Designed for growth, the MultiPoint Control Unit's architecture allows you to add additional circuit packs and carriers as needed.

Arranging Conferences

With the MultiPoint Control Unit, multipoint video conferences are easy to setup, operate, and manage. You can use the reservation software provided with the MultiPoint Control Unit, available through the Management Terminal or through the optional Conference Reservation System.

You can assign a number to each conference participant and setup the Multi-Point Control Unit to link the video endpoints at the designated time. Calls can also be initiated through the Meet-Me function, allowing participants to dial into their call using a preassigned telephone number. The MultiPoint Control Unit can also be programmed to out-dial to the video endpoints at a designated time.

The MultiPoint Control Unit also supports dedicated multipoint conferencing. Your video conference users that require regular and frequent access to multi-point video conferences can obtain system access as required.

Networking Solutions

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DEFINITY ECS provides not only powerful voice and data capabilities, but connections to a variety of voice and data networks as well. AT&T/Lucent Technologies has long been a leader in networking. DEFINITY ECS continues to build on those established networking strengths to offer you network management features, network interfaces, a variety of private network configurations, and end-to-end ISDN capabilities. Lucent Technologies leadership in developing and supporting open international networking standards is also apparent in DEFINITY ECS's compatibility with the QSIG global standards.

NOTE:
Some applications and products are unavailable in some countries. Please check with your local distributor for further information about which features and applications are available to you.

QSIG Global Networking

DEFINITY ECS was a pioneer in providing compatibility with the QSIG global networking protocol. This means you can connect the DEFINITY ECS with other switches throughout the world. Lucent Technologies developed QSIG Global Networking feature to comply with the QSIG standards developed by the European Computer Manufacturer's Association and the International Standardization Organization. It supports the ISDN-Primary Rate Interface connection from switch to switch as long as both switches support the same protocol.

QSIG Global Networking has been continually refined with each DEFINITY ECS release. The Lucent Technologies implementation of QSIG features the Name Identification supplementary service and the Call Forwarding and Call Transfer features.

The latest QSIG enhancements enable the system to move calls from their original paths to new paths that cost less or use resources more efficiently. New paths can be set up as the call is established, while it is being forwarded, or while it is being transferred. DEFINITY ECS's implementation of QSIG also supports the ISO QSIG private network diversion supplementary service, as described in the QSIG standard.

World Class Routing

DEFINITY ECS has been designed to be a world-class system that meets the needs of both domestic and global customers. One capability essential in meeting those needs is the ability to flexibly dial any location in the world, regardless of the dial plan used at that location. In recognition of this requirement, DEFINITY ECS has been designed with World Class Routing.

World Class Routing is a powerful enhancement to DEFINITY ECS's call-routing capabilities, linking several call-routing features to build a communications network capable of providing flexible call routing for any type of dialing plan while accommodating changes in both international and domestic dialing plans.

The following are key components of World Class Routing:

- Digit Conversion converts a dialed number for public network number to a private network number and vice versa. Dialed numbers matching entries in the digit conversion tables are treated and converted. Converted calls can be routed via the most optimum route, resulting in reduced network charges and appropriate use of the private network.
- Toll Analysis compares a dialed number to entries in the system's list. Based on the results, calls may be restricted from completion.
- Automatic Route Selection digit analysis compares a dialed public network number with entries in the system's tables, mapping the number to a selected public network routing pattern.
- Automatic Alternate Routing digit analysis compares a dialed private network number with entries in the system's tables, mapping the number to a selected private network routing pattern.

World Class Routing supports the Automatic Route Selection and Automatic Alternate Routing as separate features, but through generalized administration applicable to both features, provides both the same routing abilities. In addition, there are a number of capabilities that enhance the flexibility of routing in supporting your domestic and/or global calling requirements.

For example, 18-digit routing allows DEFINITY ECS to determine call routing by analyzing up to 18 digits with no restriction on the grouping or format of the digits, eliminating any assumptions about the use of a particular dialing plan.

International Direct Distance Dialed calls generally consist of an international access code, a country code, and a national number. Both codes may vary in length. DEFINITY ECS support for International Direct Distance Dialed calls eliminates any restriction on the grouping and format of digits on Automatic Route Selection numbers. Call routing is determined by the digits and the length of the dialed number.

Multinational World Class Automatic Alternate Routing allows the Automatic Alternate Routing number (Electronic Tandem Network number) to be any number of digits in length.

Digit conversion can be used to reroute numbers, initially dialed to use Automatic Route Selection, to be converted to use Automatic Alternate Routing and vice versa. This utility can analyses a maximum of 18 digits. In this way, destinations in a customer's network can be called using the public network number. This feature can also be used to reroute certain Direct Distance Dialed destinations to specified alternate destinations (such as intercept, attendant, or another Direct Distance Dialed number).

Network Management Features

DEFINITY ECS has a variety of features that enable you to manage your network resources effectively. Here are just a few examples of DEFINITY ECS features that can be used to manage your network — Time of Day Routing, Automatic Route Selection, Automatic Alternate Routing, Additional Network Feature Path Replacement, Look Ahead Routing, Subnetwork Trunking, Generalized Route Selection, Facility Restriction Level, Bearer Capacity Class, Remote Network Access, Public Network Call Priority, and Authorization Codes.

Time of Day Routing

Time of Day Routing allows you to select the most economical routing of Automatic Route Selection and Automatic Alternate Routing calls based on the time of day and week a call is made.

With Time of Day Routing, your company can take advantage of lower calling rates during specific times. If your company has locations in different time zones, you can maximize the use of your public or private network facilities by utilizing those in the location that has the lowest calling rates at the particular time a call is made. You can also use this feature to change the routing patterns when an office is closed and to eliminate unauthorized calls. You can set up eight separate time of day charts to control routing at different times of the day.

Automatic Route Selection

Automatic Route Selection routes public network calls on the most desirable (usually the most economical) trunking facilities available on your DEFINITY ECS when the call destinations are accessible through your public network.

DEFINITY ECS supports up to 640 routing patterns. Each routing pattern consists of up to 16 routing preferences (types of facilities) set up in the order you want them checked when a call is placed. Typically, the least expensive facility will be first on the list; the most expensive will be last.

If Generalized Route Selection is not being used when a call is made, the system selects a routing pattern based on the digits dialed. The routing preferences in that pattern are checked in the order they were listed, and the first available facility is used to place the call. If a facility is not available, the call can be queued until a facility becomes available.

Automatic Alternate Routing

Automatic Alternate Routing enables you to ensure that private network calls will be routed over the various trunking facilities available in your private network in the most effective manner possible. As with Automatic Route Selection, you set up various patterns for routing calls — in this case, with the private network. Depending on your DEFINITY ECS configuration, you can have up to 640 routing patterns. Each pattern includes a primary preference — the most preferred and direct route — and 15 alternate preferences. If the primary preference in a pattern is unavailable, the system searches the alternate preferences in the specified order until it finds one available.

Additional Network Feature Path Replacement

This feature allows active calls to be re-connected in order to obtain a more efficient connection. This is done via QSIG Supplementary Service Call Transfer.

Look Ahead Routing

DEFINITY ECS tries again to route an outgoing ISDN-PRI call if the call has been rejected from an ISDN trunk due to congestion. This feature allows you to administer alternate routing preferences or to specify if the original path should be tried again.

Subnetwork Trunking

Subnetwork trunking is an Automatic Alternate Routing/Automatic Route Selection function that typically converts an on-network (private network) number to a public network number (based on patterns and preferences) for off-network routing. It can also convert a public network number to a private network number.

Subnetwork trunking provides digit insertion, deletion, pauses, and/or wait for dial tone in digit outpulsing, as required, to permit calls to route to or through a remote switch, over tie trunks to a private network switch, or over central office trunks to the serving central office.

Generalized Route Selection

Generalized Route Selection gives you the capability to not only select the optimal call routing based on the dialed number, but also select the appropriate facility based on the type of call. Generalized Route Selection enhances Automatic Route Selection and Automatic Alternate Routing by incorporating additional parameters such as the type of call to be used in the decision of how a call is routed.

Different types of calls require the use of different types of facilities. For example, high-speed data calls must use digital facilities, whereas voice and voice-grade data calls can use either analog or digital facilities. DEFINITY ECS uses Generalized Route Selection to differentiate between these and other types of calls and route them on the appropriate trunks. Based on the call types and available trunk facilities, voice and data calls may be routed over different trunk types or integrated on the same trunk group. DEFINITY ECS also provides the capability to route calls based on the data format and the need for restricted or unrestricted facilities.

In order to select the appropriate trunking facility for a call, DEFINITY ECS must know the type of call being made. In order to do this, each originating facility such as a telephone or data module has a bearer-capability class assigned. Some originating facilities, such as data modules, may have multiple bearer-capability classes. Each trunk group in the routing pattern is assigned a list of allowed bearer-capability classes. When a user makes a call, the system queries the originating facility for its bearer-capability class and then tries to route the call on a trunk group with a bearer-capability class that matches the bearer-capability class of the originating facility. If an exact match is not found, the system then tries to find a trunk group with a compatible bearer-capability class.

Since the system automatically chooses the right trunk based on the system administration, the DEFINITY ECS system dial plan can be independent of the type of call being dialed. This makes life easier for your system users, who do not have to worry about dialing a different access number for different call types.

Facility Restriction Level

Facility Restriction Levels are used to limit user calling privileges for incoming and outgoing calls. The Facility Restriction Level determines if a call attempt is permitted and which routes can be used or denied in the routing process. Eight levels of Facility Restriction Levels can be assigned to telephones, computers,

system management tools. DEFINITY ECS does not require the Facility Restriction Level to be in an ascending order when administered in the patterns or preferences through system management.

When a call is attempted, the system compares the Facility Restriction Level of the telephone with the Facility Restriction Level of the trunk routes available to complete the call. If the Facility Restriction Level of the telephone is equal to or higher than the Facility Restriction Level of trunks, the call is completed; if it is lower, the call is blocked on that preference and compared to the Facility Restriction Level of the next route available. If the call fails to match the Facility Restriction Level on the available preferences, the call may queue for the first available and compatible trunk group.

DEFINITY ECS also provides a feature called Alternate Facility Restriction Levels that allows the attendant to temporarily change the Facility Restriction Levels on originating facilities to a different set of Facility Restriction Levels. It is used to grant users greater access to trunking facilities than is normally provided, such as when charges are lower during evening hours.

Bearer Capability Class

Bearer capability class uses information available in the switch to match the calling requirements of a specific call with the best available resources to support that call. Bearer capability applies to all calls and support facilities, but is of primary significance for data calls. Each call has a bearer requirement — that is, a set or range of requirements needed to support that call. For data calls. these requirements include data rate, synchronization, and channel type.

Remote Network Access

Designed to guard against unauthorized system access, Remote Network Access requires that a caller from outside the system dial either one of ten barrier codes or an authorization code to gain access to the network. Authorization codes and their corresponding network-access permissions are assigned to individual users.

When properly used, this feature enables you to control and administer system access security, while still providing your authorized users with the benefits of remote network access. The risks of unauthorized access can be minimized by combining the use of Remote Network Access with the following:

- An unpublished remote access number
- Deactivate unassigned barrier codes immediately
- Change barrier codes frequently
- Inform remote access users of their responsibility
- Monitor call detail reports for unauthorized or abnormal calling patterns

Public Network Call Priority

Public Network Call Priority provides intrusion, retention, re-ring, and mode of release control to switches on public networks. It allows you to give priority to toll calls in areas where trunks and lines are in short supply.Many of the capabilities of this feature are similar, but are referred to by different names in different countries. Public Network Call Priority can include:

- Call Retention
- Mode of Release Control
- Forced Disconnect
- Intrusion
- Re-Ring

NOTE:
All of these features are designed for special network conditions in countries outside the United States, particularly Spain, Russia and China.

Call Retention

When you make an emergency call from an analog or digital telephone and then hang up, the call is not disconnected, but put on hold. You can then reconnect to the emergency call by simply picking up the receiver again.

Mode of Release Control

Mode of Release Control is similar to Call Retention in that it retains calls, only in this case it retains calls based on administrable control parameters. The feature applies to all types of calls: incoming, outgoing, toll, local, or service. You can administer three types of control:

- Calling Party Control does not release the line until the calling party picks up.
- Called Party Control does not release the line until the called party picks up.
- First Party Control releases the line to whomever picks up first.

Forced Disconnect

This feature allows a toll network operator to disconnect a called party from a local call and connect an incoming toll call. The parties on the local call hear a warning tone before being disconnected. The disconnect is only permitted on single-station local calls and will not occur to conference calls, calls on hold, or other toll calls.

Intrusion

Intrusion is similar to Forced Disconnect, except that it allows a network operator to interrupt a local call and announce an incoming toll call. The operator hears and speaks only with the party to whom the toll call is directed. Restrictions are the same as those listed for Forced Disconnect.

Re-Ring

When a local call is interrupted by a toll call, the original call is kept on hold until the toll call in complete. When the called party hangs up after the toll call, the system rings back to remind the called party that the original call is still active.

Authorization Codes

Authorization codes are used on particular calls to temporarily raise a telephone's Facility Restriction Level. This is useful for those who make calls from telephones other than their own or from outside the network. If a call you dial is blocked because the telephone's Facility Restriction Level is too low, you can enter your authorization code. If the Facility Restriction Level associated with the authorization code is equal to or higher than the Facility Restriction Level of the trunk facilities required to place the call, the call is then completed. Up to 90,000 different authorization codes will be in effect for your system at any one time. Using DEFINITY ECS's system management tools, you can assign authorization codes and change their associated Facility Restriction Level and network access permissions.

Network Interfaces and Equipment

DEFINITY ECS supports a variety of interfaces to voice and data networks. Trunks supply links between DEFINITY ECS, the public network, and other switches. DS1 interfaces offer high-speed digital connectivity between switches.

Trunk Group Circuits

Trunks provide the communications links between DEFINITY ECS and other switches, including central office switches and other premises switches. Trunks that perform the same function are grouped together and administered as trunk groups. Trunks interface with DEFINITY ECS via port circuit packs. DEFINITY ECS trunk group circuit types include the following:

Local Exchange Trunks

Local exchange trunks connect DEFINITY ECS to a central office. The following are some of the types available:

- Central office trunks, which connect DEFINITY ECS to the local central office for incoming and outgoing calls
- Foreign exchange trunks, which connect DEFINITY ECS to a central office other than the local one
- Wide Area Telecommunications Service trunks, which allow you to place long-distance outgoing voice-grade calls to telephones in defined service areas, priced according to distance in the service area, length of the call, time of day, and the day of the week
- 800-service trunks, which let your business pay the charges for inbound long-distance calls so that callers can reach you toll-free
- Direct Inward Dialing trunks, which connect DEFINITY ECS to the local central office for incoming calls dialed directly to stations without attendant assistance
- Digital Service 1 trunks, which can be used to provide T1 or ISDN Primary Rate Interface service

Tie Trunks

Tie trunks carry communications between DEFINITY ECS and other switches in a private network. Several types of trunks can be used, depending on the type of private network you establish.

Auxiliary Trunks

Auxiliary trunks connect devices in auxiliary cabinets with the switch. Some of the features that are supported with this type of trunk are recorded announcements, telephone dictation service, malicious call trace, and loudspeaker paging.

Miscellaneous Trunks

Miscellaneous trunks perform functions that do not fit neatly into any of those already described:

- Release-link trunks are used between switch locations to provide Centralized Attendant Service or Automatic Call Distribution group availability.
- Remote-access trunks provide off-premises users with access to DEFINITY ECS features and networking.

Digital Interfaces

Lucent Technologies supports both T1 and E1 facilities. As industry standards around the world, T1 and E1 facilities provide the latest alternative to analog trunking.

E1 Interface

DEFINITY ECS also supports E1 connections. T1/E1 access and conversion allows simultaneous connection to both T1 (1.544 Mbps) and E1 (2.048 Mbps) facilities (using separate circuit packs).

T1 Interfaces

When planning your networking requirements, one of the options you should consider is multiplexing over Digital Services 1 (DS1) facilities. As the industry standard for interconnecting digital systems, DS1 is an economic alternative to analog trunking arrangements. Multiplexing up to 24 digitized voice/data communications paths onto a single T1 carrier or other high-speed digital facility (such as fibre or microwave) can reduce your network trunking and equipment costs.

Used to connect switches to the public network or to other switches in a private network, DS1 also delivers high-speed, end-to-end digital connectivity. Voice and data calls are completed at transmission speeds of up to 64 kbps.

DEFINITY ECS offers several options in supporting the DS1 interface. The options include support for voice-grade DS1, alternate voice/data, and Digital Multiplexed Interface. The voice-grade DS1 interface is a T1 D4 channel-bank-compatible interface that does the following:

- Uses in-band bit-robbed signaling to provide 24 voice-grade-only tie trunks consisting of 56-kbps channels for voice and voice-grade data transmission
- Interconnects DEFINITY ECS with other switches with an external D4 channel bank or with other switches (analog or digital) having the appropriate interfaces
- Interconnects DEFINITY ECS with central offices such as Lucent Technologies 4ESS switch (where services such as MEGACOM and Software Defined Network can be accessed) and 5ESS switches
- Interconnects DEFINITY ECS with private networks by connection with DS1 facilities
- Can be used with the same Automatic Alternate Routing capabilities as normal analog E & M lead tie trunks

Configuring your DEFINITY ECS with an alternate voice/data DS1 interface does the following:

- Uses out-of-band signaling in which signaling information is multiplexed onto one of the 64-kbps digital channels
- Permits end-to-end voice and digital data connections between DEFINITY ECS switches
- Delivers 23 clear 64-kbps digital channels plus one signaling channel multiplexed onto a 1.544-Mbps DS1 line with provisions for framing, maintenance, and signaling
- Delivers 8-kbps timing and slip information for synchronization subsystem
- Supports ground-start and loop-start switch-central office, foreign exchange, and Wide Area Telecommunications Service (inbound/outbound) trunks, as well as direct inward dial trunks, off-premise stations, and dedicated voice/data switch connections

DEFINITY ECS DS1 interface capabilities include support for Digital Multiplexed Interface.

To achieve even greater benefits than those just listed, you can combine DEFINITY ECS DS1 interfaces and ISDN-Primary Rate Interface to give you additional capabilities. ISDN-Primary Rate Interface is a DS1-compatible direct-connect access service that links the intelligence inherent in the network with the intelligence provided by your DEFINITY ECS.

For example, with ISDN-Primary Rate Interface, the Software Defined Data Network service may be accessed. Software Defined Data Network provides virtual private-line connectivity, via the switched network, for voice, data, and video applications. Software Defined Data Network services complement the Software Defined Network voice services.

DEFINITY ECS delivers Automatic Restoration capability with Software Defined Data Network, which restores disrupted connections between access endpoints (non-signaling trunk) and data endpoints (devices that connect the switch to computers and data communications equipment). This restoration is achieved within seconds of a service disruption so that critical data applications can remain operational.

Stratum 3 Clock

Many companies have solved their communications network needs by using high-speed digital facilities. However, many have found that standard synchronization timing systems are not accurate enough in these situations. Standard systems allow more slippage than is desirable for operations like high-speed bulk data transfer. The result is bit and frame losses which lead to lost data.

Stratum 3 clock is an optional external hardware adjunct for DEFINITY ECS that is more accurate than standard systems. Stratum 3 clock has a maximum of 2.5 minutes of allowable error per year. The standard clock used in DEFINITY ECS and many switch systems is a stratum 4E clock, which allows approximately 17 minutes of error per year.

ISDN

Lucent's DEFINITY ECS provides complete ISDN support for small systems with 20 telephones up to large systems with 25,000 telephones. Demonstrating its role as a leader in making ISDN a universal reality, Lucent Technologies makes it possible for anyone connected to DEFINITY ECS to benefit from ISDN capabilities and features.

ISDN eliminates the need for multiple, separate access arrangements for voice, data, facsimile, and video services and networks. Using the same pair of wires that now carry simple telephone calls, ISDN can deliver voice, data, and video services in digital format.

ISDN is a global access standard established by the Consultative Committee for International Telephone and Telegraph designed to help you move and manage information with unprecedented ease and productivity — anywhere in the world. ISDN uses a layered protocol that conforms to layers one, two, and three (physical, link, and network layers) of the seven-layer Open Systems Interconnect Reference Model of the International Standards Organization.

DEFINITY ECS supports the two major interfaces specified in the ISDN standards — Primary Rate Interface and Basic Rate Interface.

- Primary Rate Interface is used for connecting premises equipment such as switches to the network, and acts as a powerful interface between intelligent equipment such as switches and computers.
- Basic Rate Interface is used for connecting telephones, computers, personal computers, and other desktop devices to higher-order equipment such as a switch. BRI can also be used as a trunk interface, for example, connecting a Central Office to a PBX.

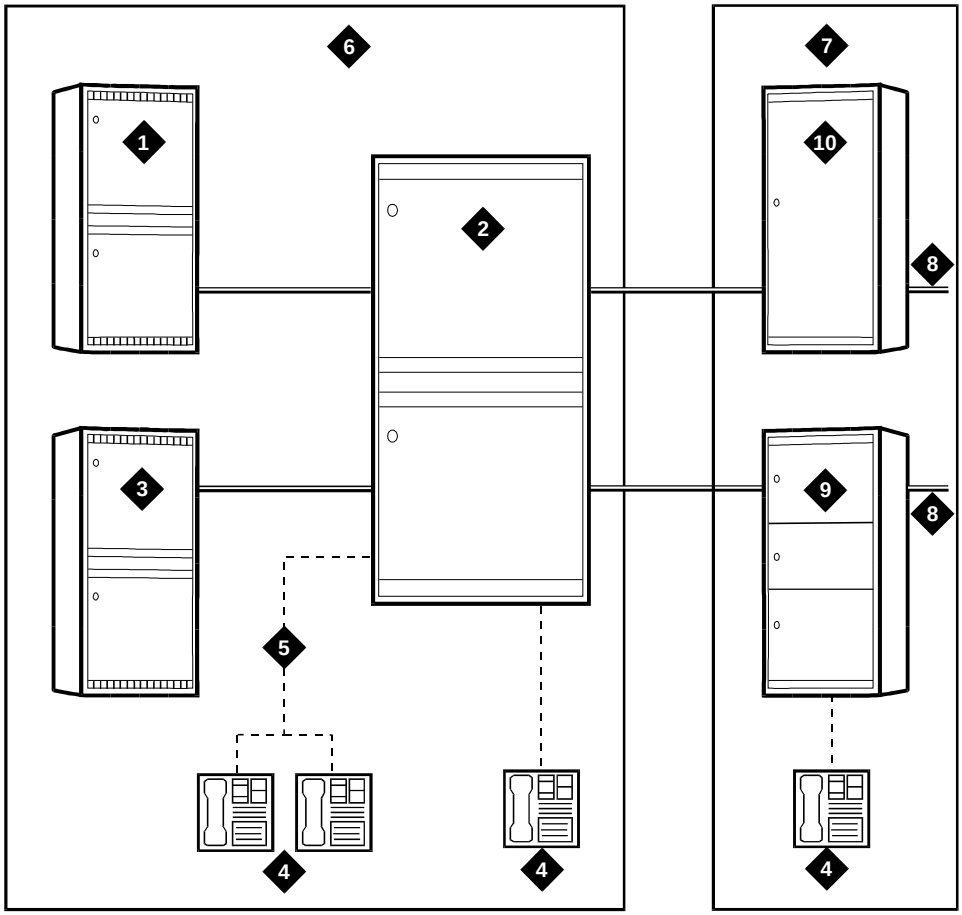
Both Primary Rate Interface and Basic Rate Interface are based on the same common building blocks — the use of a common interface to a transmission path that is divided into channels. Both Primary Rate Interface and Basic Rate Interface use two types of channels for communication:

- Bearer channels are the communications links in ISDN. They provide 64-kbps digital communications service for voice, data, video, and other information transmission.
- Delta channels, sometimes known as data channels, are the signaling links in ISDN. They carry call-control and call-related information, such as caller ID, between ISDN endpoints.

Primary Rate Interface, referred to as 23B + D or 30B + D on an E1 interface, uses 23 or 30 64-kbps B channels and one 64-kbps D channel. The 23 or 30 B channels can be used for 23 or 30 individual voice or data calls. Basic Rate Interface, referred to as 2B + D, uses two 64-kbps B channels and one 16-kbps D channel. The B channels give the user simultaneous voice and data transmission over the same connection. This channel architecture allows full and complete use of the 64-kbps B channels from endpoint to endpoint for information movement managed by signaling messages, called Q.931 messages, in the D channel.

To help your business achieve maximum benefits from ISDN and the public network, the following features reside within AT&T's ISDN service nodes.

- Call-by-Call Service Selection lets you reach multiple AT&T services via the same ISDN B channel. Therefore, a channel can be allocated among MEGACOM Wide Area Telecommunications Service, MEGACOM 800 Service, and other services on a dynamic basis, eliminating the need for dedicating each trunk or channel to a specific service.
- Automatic Number Identification, marketed as Information Forwarding-2 (INFO-2), is available on MEGACOM 800 Service. INFO-2 delivers the originating calling party's billing number to your DEFINITY ECS. In a call center environment, DEFINITY ECS can pass this information on to a computer application via a computer-telephone integration interface to perform customer record lookups — thereby increasing agent productivity.
- Station Identification Number, similar to INFO-2, identifies the calling party number behind the switch. Station Identification delivers the originating caller's telephone number to the network where it is sent to the terminating location.



1) DEFINITY ECS
2) DEFINITY ECS
3) DEFINITY ECS
4) Basic Rate Interface Telephone
5) Passive Bus
6) Private ISDN
7) Public ISDN
8) Public and Private Networks
9) Central Office Switch
10) Tandem Switch

Figure 12-1. DEFINITY ECS and ISDN

- User-to-User Information sends user information from one endpoint to another using the D channel. Three forms are available: message associated data, sent within Q.931 call control messages during call establishment and call clearing; call-associated data, sent during call setup on a B channel; and noncall-associated data, sent with no related call-setup activity on the B channel. Applications for this feature include DCS, Look-Ahead Interflow, and display of calling party name and number.

DEFINITY ECS's support of ISDN-PRI, ISDN-BRI, and available public network services means that you can achieve full end-to-end ISDN connectivity and take advantage of ISDN services and features. For example, two switches connected by Primary Rate Interface can exchange calling party name and/or number information. The information is displayed on the called party's telephone. In addition, the called party's ID is also displayed at the calling party's telephone. This lets users identify the source of an incoming call before answering. Computer telephone integration interfaces can also use the information provided by the network to integrate your communications and data-processing systems.

The ISDN-BRI Trunk circuit pack allows DEFINITY to support the S/T interface as defined by ISDN standards (ITU-T recommendation I.411). The circuit pack provides eight ports to the network and each port supports two B channels and one D channel. ISDN-BRI Trunk provides the following advantages:

- Provides an inexpensive way to connect to ISDN services provided by the network provider.
- Meets all ETSI protocol requirements and almost all country-specific requirements.
- Supports essential (not supplementary) ISDN services.

DEFINITY ECS also adds the following capabilities to the basic ISDN services, depending on local availability of support.

- ISDN flow control monitors message activity on the Primary Rate Interface D channel.
- Non-Facility-Associated Signaling allows a Primary Rate Interface D channel to supply signaling for B channels (voice and data) located on Primary Rate Interface interfaces other than the one where the D channel is found. As a result, one D channel can support call control and signaling for up to 20 Primary Rate Interfaces.
- D Channel backup, when administered, improves reliability in the event of a signaling link failure on a Non-Facility-Associated Signaling D channel group. A primary D channel provides signaling for the Non-Facility-Associated Signaling D channel group (two or more Primary Rate Interface facilities). A second D channel, located on a separate Primary Rate Interface facility of the same Non-Facility-Associated Signaling D Channel group, is designated as a backup. If the primary D channel fails, call-control signaling automatically transfers to the backup D channel.

- Temporary signaling connections are virtual packet-oriented D channel connections used to exchange user-to-user information on DCS over ISDN D channel and DCS AUDIX applications. Call-associated temporary signaling connections permit information exchanges that are associated with an existing B channel connection and noncall-associated temporary signaling connections allow this information exchange when no B channel connection exists. A user may request a call-associated temporary signaling connection either at call setup time or after the call has been setup. A call-associated temporary signaling connection is cleared when the associated B channel is cleared.

By combining AT&T's public network services and ISDN features with ECS's ISDN and system features, you can differentiate your business from your competitors', both in improved customer satisfaction and in greater operating efficiency. The result is improved profits and reduced costs. Here is a brief glance at a few of the possible ISDN applications:

- Combined incoming and outgoing call centers
- Dealer locator
- Sourcing
- Consumer-to business and business-to-business data retrieval
- Logging for callback
- Outgoing call management

Centralized Attendant Service

DEFINITY ECS owners who have more than one switch location can benefit greatly by using the Centralized Attendant Service feature. Centralized Attendant Service reduces the number of required attendants, and, in most cases, all those attendants can be located at one of the switch locations, called "main." Switches at the other locations, called "branches," redirect their calls to the Centralized Attendant Service main. Thus, a company can have a centralized attendant group at the headquarters office and can handle calls from there for the branch offices.

All locations in a Centralized Attendant Service arrangement have a listed directory number. Calls to a branch listed directory number terminate at the main location, even if the branch location has an attendant. These listed directory number calls are routed to the centralized attendant group over trunk circuits called release-link trunks. These release link trunks are used only for centralized attendant calls and signaling.

After a call is processed by the centralized attendant, it is extended back to the branch location. The release link trunk is then dropped and made available for other calls to the centralized attendant.

If a DEFINITY ECS is a node within a Distributed Communication System and Centralized Attendant Service is provided, a centralized attendant can do the following:

- Control access to specific trunks at other nodes
- Directly access to specific trunks at another location
- Place test calls to telephones and trunk groups at other nodes
- Receive a visual warning that all trunks in a remote trunk group are busy or that the number of busy trunks in a remote group has reached a specified level

This feature ensures that all calls directed to an attendant at your company are handled efficiently.

Main/Satellite/Tributary

If you have modest network requirements, a main/satellite/tributary configuration is an attractive possibility for private networking. In this configuration, one DEFINITY ECS location is the main, and remote switches are satellites or tributaries. Attendant positions and public network facilities are usually concentrated at the main.

All calls to or from a satellite pass through the switch at the main. The system appears to be a single switch with one listed directory number. A uniform dial plan provides a common four-digit or five-digit dial plan for a main/satellite configuration.

A tributary is similar to a satellite, but it has one or more attendant positions and its own listed directory number. Calls to its listed directory number go directly to the tributary.

The switches in a main/satellite/tributary network are connected by tie trunks. Trunks and switching facilities can be added as requirements grow.

An important DEFINITY ECS networking feature is Main/Satellite Extended Trunk Access. Extended Trunk Access allows dialed digits that are undefined at a satellite or tributary switch to be routed over a trunk group to a main switch for interpretation. This means changes to the network numbering plan do not have to be propagated to all switches. Extended Trunk Access improves your control and reduces administration costs by making trunk networks considerably easier to maintain.

Electronic Tandem Network

If your company requires a medium to large network spanning a large geographic area, nationwide or even worldwide, Electronic Tandem Network is the answer. An Electronic Tandem Network is a wide-area private network that tandems calls through one or more switches to route the calls to their destinations.

An Electronic Tandem Network consists of tandem switches, inter-tandem tie trunks that interconnect them, access or bypass trunks from tandem switches to main switches, and the software and equipment to support call routing over the trunking facilities. Different Electronic Tandem Network locations are connected via analog or digital tie trunks. For example, a DS1 interface can act as a high-speed (1.544 Mbps) digital backbone for voice and data communications between Electronic Tandem Network locations.

An Electronic Tandem Network can be configured hierarchically. An Electronic Tandem Network can connect individual switches; it can also connect other private networks (such as Main/Satellite/Tributary networks) together.

Within an Electronic Tandem Network, each location is identified by a unique private network location code, similar to the public network office codes that exist within an area code. When accessing the Electronic Tandem Network, a user simply dials the network office code plus the desired extension number, for a total of seven digits.

In an Electronic Tandem Network, DEFINITY ECS provides a variety of features on a network-wide basis. Here are a few examples:

- Uniform Dial Plan — A unique four- or five-digit number assigned to each station on the network. Uniform numbering gives each station a unique number (location code plus extension) that can be used at any location in the Electronic Tandem Network to access that station, DEFINITY ECS enhances the standard uniform dial plan with the unrestricted 5-digit uniform dial play, which allows up to five digits to be parsed for call routing.
- Extension Number Portability — When employees move within the network, they can retain their extension numbers. The ability to keep extension numbers, and even Electronic Tandem Network and Direct Inward Dialed numbers, when moving to other locations within the company eliminates missed calls and saves valuable time.
- Traveling Class Marks — Traveling Class Marks are a mechanism for passing a caller's facility restriction level from one Extended Tandem Network switch to another. Traveling Class Marks allow privilege checking to be passed across switches through the Electronic Tandem Network.
- Automatic Alternate Conditional Routing — You can control the routing of particular calls using conditional routing. For example, you can limit the number of communications satellite hops (communications satellite links

used as trunks) in any end-to-end private network routing pattern. Limiting the number of satellite hops may be desirable for controlling transmission quality or call delay in both voice and data calls.

- Automatic Transmission Measurement System — You can use this feature to perform routine and on-demand maintenance tests on facilities in the Electronic Tandem Network.
- Enhanced Trunk Signaling and Error Recovery — The reliability of Electronic Tandem Network calls is improved by allowing a trunk call to be retried on another circuit when signaling failures occur.

Distributed Communication System — Integrated SDN and Non-Integrated SDN

For a single-location or multi-location company that requires several systems, Distributed Communications System (DCS) may be the answer. DCS is a network arrangement of private switches, referred to as nodes. The maximum number of nodes that can be in a DCS varies from 20 to 63, depending on the particular configuration of switches. DCS nodes can be physically located in the same building, spread across a campus, or scattered across the country or around the world. Tie trunks interconnect the switches that serve the DCS complex. The tie-trunk network may be configured as a tandem tie-trunk network, a main/satellite/tributary network, or an Electronic Tandem Network. The links connecting a Distributed Communication System may also be provided across a Software Defined Network.

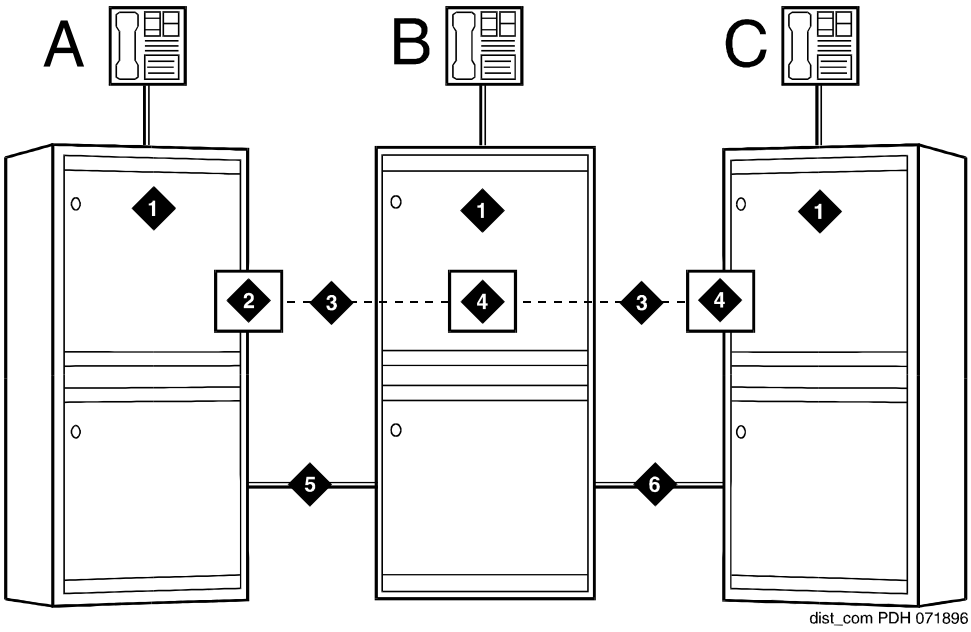
The functions and features of Distributed Communication System are made possible by the use of an advanced X.25 (BX.25) inter-processor data link connecting each switch, allowing call-processing to be passed from one switch to another. The data link supplies selected feature transparency and efficient utilization of facilities that can be shared.

Feature transparency means that features work the same from the user's perspective, whether the telephones involved are assigned to the same switch or different switches. Users in a DCS can dial each other with four or five digits as if they were all on the same switch.

Here are just a few examples of feature transparency in a Distributed Communication System:

- DCS With Reroute — Distributed Communication System with Reroute optimizes trunk usage for certain DCS features.
- Leave Word Calling — Allows you to touch a button on your voice-terminal and leave a standard "call me" message with your name and phone number. When your DEFINITY ECS is linked with other switches in a DCS, you can call any employee in your company and press the Leave Word Calling button to automatically leave a message requesting a call back.

- Calling-Party Name Display — If your telephone is equipped with a digital display, information about the person calling you is displayed before you pick up the receiver. You can know who is calling if that person is in a nearby building or even across the country.
- Centralized Messaging — Messaging services for the entire Distributed Communication System network may be coordinated by one system, depending on volume and the version of the main and remote switches. This means that switches with smaller messaging requirements do not share a voice messaging system with another switch.



1) DEFINITY ECS: DCS node
2) Processor Interface
3) Data links (BX.25 protocol)
4) Packet Gateway
5) Tie Trunk: DS1
6) Tie Trunk: ISDN-Primary Rate Interface switched network or private line

Figure 12-2. DEFINITY ECS as Part of a DCS

Distributed Communication System nodes are connected by tie trunks (using DS1 and ISDN-Primary Rate Interface facilities, for example). In addition, a data link is provided between the various nodes (additional equipment such as a data module may be required), offering selected feature transparency across the network. With ISDN-Primary Rate Interface, the data link can be configured to use either a B-Channel or D-Channel. In Figure 12-2, Telephone A calls Telephone B and then sets up a conference with Telephone C; certain system features operate as if the telephones were all on the same switch.

DEFINITY ECS's Distributed Communication System features a sophisticated rerouting capability for optimizing trunks. Thus when you transfer out of your AUDIX voice messaging system, for example, DEFINITY ECS sets up a new path that optimizes system resources.

Distributed Communications System and ISDN

To support DCS customers who also have ISDN-Primary Rate Interface, DEFINITY ECS can transport DCS messages over ISDN-Primary Rate Interface D channels. As a result, you are not longer limited to private-line connections between your various locations. You can also use public network services.

Software Defined Network supports all DCS features except the following:

- DCS attendant control of trunk group access
- DCS attendant direct trunk group selection
- DCS busy verification of terminals

All other capabilities and limitations associated with the DCS still apply. This allows your company to enhance network functions by adding the benefits of ISDN QSIG.

DEFINITY ECS also supports networking between the DCS signaling on the ISDN D channel and the DCS signaling on traditional signaling links. AUDIX systems network via DCS can also be supported over ISDN-Primary Rate Interface.

Wideband Signaling

DEFINITY ECS's support of wideband signaling allows the system to handle applications with transmission rates greater than 64 Kbps in a single call. This includes videoconferencing, Local Area Network bridging, and other wideband applications. The system switches wideband data at N x DS0 data rates — a standard for international networking.

Systems with only narrowband capabilities typically handle wideband transmissions by splitting the data stream into several calls. Advantages of wideband signaling support include:

- Inexpensive transmission: Wideband calls are often tariffed differently. In the United States, wideband calls are about 30 percent less expensive than narrowband calls.
- Simplified billing: Because there is just one call, there is just one record, making billing and traffic measurements easy.
- Reliability: Because the data stream is not split, there are none of the synchronization problems or individual channel failures that can delay or disrupt narrowband switching of wideband data.
- Faster call setup: Placing a wideband call is faster than placing a narrowband call because ISDN is used and because there's only one call to place, as opposed to several.
- Simplified administration: Wideband signaling is administered on the DEFINITY ECS switch; handling wideband signaling on a narrowband switch typically requires additional equipment which must be administered separately.

All of DEFINITY ECS's networking features have been upgraded to handle wideband signaling, notably:

- Access endpoints
- Administered connections
- Mixed mode signaling
- Call-by-call service
- Auto restoration
- World Class Routing
- ISDN

These upgrades further simplify the process of combining public and private networks and enhance the efficiency of combined networks.

Service Upgrade Solutions

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Upgrading service typically presents a series of challenges. Will the new equipment be compatible with existing equipment and the local network? Must the service be interrupted? If so, for how long? Is it necessary to replace all related equipment? How much time must be budgeted for installation and retraining of administrators? How much space will the new system require? DEFINITY ECS actually expedites service upgrades because Lucent Technologies design engineers considered each aspect of the process:

- Connecting to the existing network
- Amortizing replacement costs
- Ensuring uninterrupted service during transition to a new system
- Storing new equipment
- Making optimum use of available lines
- Re-training administrators
- Backward compatibility
- Seamless integration

Connecting to a Network

Upgrading telephone service in remote areas sometimes requires adapting equipment to work with unusual protocols. DEFINITY systems have been quickly modified to be compatible with networks in the remotest parts of the world.

Lucent Technologies has been a pioneer in providing compatibility with the Q-SIG global networking protocol. This protocol has been adopted by the International Standardization Organization as a global ISDN-based private networking standard. The DEFINITY ECS is thus not only adaptable to existing protocols, but readily communicates with new systems throughout the world.

Amortizing Replacement Costs

Sometimes your budget may not allow for wholesale replacement of all telecommunications equipment at once. The aggregate replacement cost of telephones, computers, and other desktop equipment can be high, even if the costs of the individual items are low. Ideally, this equipment can be replaced in stages, spreading the cost out over time. This requires, however, that the new switch be compatible with the old equipment.

DEFINITY ECS allows you to extend the life of your peripheral equipment indefinitely. It accommodates analog telephones, for example, and efficiently switches analog data. In addition, various financing options allow you to synchronize equipment payments with your cash flow cycles.

Ensuring Uninterrupted Service

An important consideration when upgrading service is, “How much time will our employees lose while the system is being connected?” In most cases, the interruption in service is minimal because the system is designed to be connected in parallel with the working switch. Even in a remote area where the equipment being replaced is very old, the switching can be transferred in a matter of hours.

Another consideration is, “How long will it take our people to adjust to the new system?” Again, this adjustment period is minimized by DEFINITY ECS’s adaptability. Using the automatic route selection feature, the system can be configured to imitate the old switching system for the user’s benefit. In a remote Russian town, for example, a nurse at the hospital still dials the same six-digit number she has always used to call home. What she does not know is that her home number is now actually an extension on the DEFINITY ECS. A hidden translation has allowed her to retain her home telephone number. DEFINITY ECS accommodates users in such a way that there is no difference in dialing an inside or outside call. Feature access codes can be assigned to mirror the old system as well.

Storing New Equipment

In one area, a steel plant's old communications system had occupied an entire floor of one building. A four-story building was planned for housing the new switch. The compact DEFINITY ECS required only one 4 X 8 meter room, which included plenty of room for expansion.

Making Optimum Use of Available Lines

Because many lines in some remote areas do not operate properly, sometimes as many as 40 percent more lines are used than are necessary for adequate service. Once a DEFINITY ECS is installed, the system generates detailed traffic reports that document the relative reliability of the lines. This allows the staff to eliminate unreliable lines or petition for their repair, increasing overall system efficiency. The system's alarm reports even provide troubleshooting information for neighboring switches in the public network.

Many DEFINITY ECS network enhancements are designed to optimize resources where lines and trunks are in short supply. See Chapter 12, "Networking Solutions" for more information.

Re-training Administrators

The reliability of the DEFINITY ECS system has allowed some organizations to profitably redeploy maintenance staff. Time-consuming daily maintenance is replaced by occasional attention to the system. The new G3-Management Applications software runs on a personal computer and saves administration time by automating repetitive tasks and consolidating related data. Recording moves and changes in all directories, for example, has never been easier. In some cases, the DEFINITY ECS is actually maintained remotely by Lucent Technologies personnel.

Backward Compatibility

DEFINITY ECS is essentially compatible with older Lucent and AT&T products. This means that when you upgrade from an older AT&T or Lucent system to a DEFNITY ECS you will not lose some capabilities while gaining others. For example, DEFINITY ECS now allows you to have Trunk Access Codes and feature Access codes that differ by only one digit, which facilitates upgrades from a DEFINITY G2, System 85 or DIMENSION switch to a DEFINITY ECS.

Seamless Integration

Often when you must considerably enlarge your communications system, you are essentially charged the equivalent of a new, larger system. This is not the case with DEFINITY ECS. The hardware and software are bundled in such a way that you will only incur normal, incremental costs as you increase port capacity, even if you increase that capacity as much as one hundred-fold. DEFINITY is designed for easy expansion, rather than replacement.

System Management Solutions

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Managing a powerful communications system like DEFINITY ECS was once a formidable task, requiring specially trained administrators who could operate complex programming tools. But, as the capabilities of systems become more sophisticated, so too have the tools that administer them.

DEFINITY ECS offers a variety of easy-to-use modular tools for managing your system. Whether your system is small or large, stand-alone or networked, DEFINITY ECS has the tools to efficiently manage that system.

Terminal and facility administration features allow you to administer telephones, computers, facilities, and features throughout your system or network. Traffic management features allow you to measure, manage, and report on the voice and data communications traffic throughout your system or network. Maintenance features allow you to view the health of your system and perform maintenance procedures on your own system, if you choose to do so.

This broad system management philosophy extends DEFINITY ECS's power and flexibility into the tools for managing the system. These tools are based on the user-friendly architecture which is the hallmark of DEFINITY products. The system management capabilities of DEFINITY ECS have been enhanced to accommodate all configurations.

NOTE:
Some applications and products are unavailable in some countries. Please check with your local distributor for further information about which features and applications are available to you.

System Management Terminal and Applications

DEFINITY ECS Management Terminal and Enterprise Management Applications are two fundamental options for managing different systems based on size and requirements. They have been designed with similar user interfaces. Screen layouts and the use of commands and keys are much the same. This means that you can migrate from one option to another smoothly and with minimal training.

DEFINITY ECS Management Terminal

The Management Terminal is the integrated management tool built into every DEFINITY ECS. DEFINITY ECS Management Terminal is the best built-in management product available. It provides an intuitive interface with forms-based selections, help keys, and a language-based interface (several languages are available).

The system administrator uses a DEFINITY ECS Management Terminal to access the system to perform "task-oriented" administration and maintenance procedures. Several types of asynchronous terminals can be used as the Management Terminal. One such terminal is the Lucent 715 Multitasking Terminal.

Using the Management Terminal, the system manager can do all of the following:

- Manage system, voice-terminal, and data-terminal features on a day-to-day basis
- Perform system backups
- Monitor system performance
- Perform selected maintenance procedures
- Maintain system security

DEFINITY G3 Management Applications

The G3 Management Applications, a personal computer-based tool, provides enhanced system management capabilities for DEFINITY ECS. The G3-Management Applications software runs on a selected list of certified UNIXWARE-based personal computers. See your Lucent Technologies account team for information on approved personal computers.

The G3-Management Applications software is composed of the G3-Management Applications "environment" that provides the tools and basic features of the G3-Management Applications and G3-Management Applications "applications" that run on top of the environment. The G3-Management Applications environment capabilities and applications include the following:

- Configuration Program displays information about the G3-Management Applications hardware and lets the user select color-scheme and display options.
- Emulation is an enhanced terminal emulation with keyboard and mouse cursor control, color screens, and extended help windows.
- Communication makes Electronic Industries Association RS-232 connection to the switch.
- Customer Release allows the G3-Management Applications to store information about each switch supported by the G3-Management Applications, including such information as switch release and version, switch name, and dial-up information.
- Data Management allows the system manager to:
  - — Print custom-formatted reports of gathered switch data
  - — Format G3-Management Applications data for export to other systems such as database management systems
  - — Use an alternate way to access enhanced emulation for real-time communication with switch
  - — Retrieve switch data as needed and save in standard personal computer files for printing or exporting
- Enhanced Data Management allows the system manager to:
  - — Make global changes rapidly to large amounts of switch translation data (such as changing set types, changing coverage path assignments, or changing class of service or class of restriction assignments) by creating a template for global changes
  - — Provide transaction generation in order to pre-process switch-based commands on the personal computer, and later send them to the switch
- Bulk Administration is a set of administration capabilities that allow the system manager to administer many stations in bulk rather than on a station-by-station basis. It is primarily used during major moves or changes when the switch hardware is not yet available. Capabilities include:
  - — Alias stations by mapping unsupported set types to supported set types
  - — Create station models that contain feature information common to station user groups
  - — Administer Basic Rate Interface sets in multipoint configuration
  - — Create station detail records
  - — Define hunt groups
  - — Group and list provisioning

  - — Generate (download) merged station and model data to the switch
  - — Perform audits
- AUDIX Data Exchange allows you to transfer common data between a switch station form and an AUDIX subscriber form. This allows you to use your PC for both switch administration and AUDIX administration.

TERRANOVA ECS Administration

TERRANOVA ECS Administration is a software package for your personal computer that allows you to use the computer as an administration terminal. Advanced capabilities allow you to retrieve configuration and traffic information and generate reports.The software includes the following modules:

- ECS Communication emulates several common terminal types, allowing you to access multiple systems from a single personal computer.
- ECS Reports Generator provides graphic displays of system configurations and produces a variety of system administration reports. Besides printing the reports, you can save the reported data and export it to other data management applications.
- ECS Station Administration allows you to add, change, remove, and duplicate stations, coverage paths, and pickup groups. Using graphical representations of stations and global change tools, you can create custom labels and schedule downloads of adds, moves, and changes.
- ECS Trunk Group Analyzer gathers usage information and provides tools for conducting what-if and grade-of service analysis for traffic performance across the system.
- ECS Auto Transfer automatically extracts call accounting data for station and trunks at a pre-set time and presents the information in a formatted file on the local server or shared network drive. It provides an open interface that allows accounting vendors to integrate the data into their call accounting products.

OneVision™ Enterprise Network Management Applications

Given its ability to handle many types of information and protocols, DEFINITY ECS is the ideal platform for managing your voice, data, and video communications as one unit. The OneVision Enterprise Network Management Applications provide several options for accomplishing this.

DEFINITY G3 Fault Management

DEFINITY G3 Fault Management helps you manage related applications and equipment from one computer. It uses the industry standard Simple Network Management Protocol to deliver information to a network management computer. On the computer, the software presents a graphical representation of each sys-

tem in the network. When an alarm occurs on any of the systems, the icon representing the switch changes color, indicating the severity of the alarm. The system then allows you to zoom in on the various switch components to target the trouble. It provides detailed information about the components during this troubleshooting process. You can query the system for detailed information at any time and request equipment inventories.

DEFINITY G3 Proxy Agent

The DEFINITY G3 Proxy Agent accesses the system management information on DEFINITY and makes it available via the industry standard Simple Network Management Protocol. It provides that information to the DEFINITY G3 Fault Management application. The protocol is one of several supported by TCP/IP, which is used by many product vendors to send the management information to network management systems.

The enhanced cut-through capability provides access to the DEFINITY ECS integrated management utilities so you can manipulate the system databases. Since the network management computer allows you to view both the switches and associated LANs from a single platform, it is possible to see what is happening simultaneously to both the voice and data networks.

When used together, the Fault Management and Proxy Agent applications provide network perspective and switch management from one station.

System Access

DEFINITY ECS's open architecture makes for relatively easy access to essential data.

System Access Interface Support

System Access is the basis for transferring data and administrative commands back and forth between DEFINITY ECS and processor-based adjuncts. It provides external access to the system management, maintenance, and traffic data that is normally available only via the Management Terminal.

DEFINITY ECS System Access includes the end validation feature, which allows translations to be validated by the switch without actually committing a change to the switch. This allows the switch to check translations for errors without making a change in the switch data. End validation is useful for performing data validation on translations that will be downloaded to the switch, as well as for performing audits on translations stored in the adjunct. This capability makes it possible for adjuncts to validate translation data without maintaining a switch image database or a copy of the switch validation rules.

Concurrent User Sessions

In order to increase the efficiency of administration and maintenance functions, the DEFINITY ECS switch accommodates multiple concurrent administration and maintenance user sessions. Three or more devices (management terminals or operation support systems) can be connected to the switch to perform administration and/or maintenance tasks simultaneously. DEFINITY ECS supports eight concurrent administration and maintenance users — five can perform concurrent administration, and three can perform concurrent maintenance. The eight concurrent sessions can be in any combination of local and remote connections.

This feature increases the volume of administrative activity that can be performed in a given time period, allowing administrators to handle peak demand more effectively.

Host Interface

Host Interface, a G3-Management Applications capability, gives you direct access to data residing in the G3-Management Applications database. Using standard terminal emulation software with the XMODEM interface, you can retrieve DEFINITY ECS information to populate your own customer-developed databases.

Terminal Administration

DEFINITY ECS includes features that ease, simplify, and accelerate the administration process from a terminal.

Administration Without Hardware

Administration without hardware gives you the ability to administer station forms without specifying a port location. Administered stations will not cause alarms or errors to be generated when the station is translated but not yet installed. These station types are referred to as “phantom” stations. Phantom extensions can be used for Automatic Call Distribution Dialled-Number Identification Service. This allows a phantom extension to be administered on the switch for each call type that needs to be identified to agents. The phantom Automatic Call Distribution extension either is “call forwarded” (via an attendant console) to an Automatic Call Distribution split or has its coverage path defined to include the Automatic Call Distribution split. The name field administered for the phantom extension will identify to the Automatic Call Distribution agent which service the caller is attempting to reach, allowing the agent to properly address the caller.

Administration Without Hardware also supports the ability to store station templates (models). These can later be used with the duplicate station command to implement many station forms of the same type in the switch.

Administration Without Hardware can be used to streamline system initializations, major additions, and rearrangement/changes by allowing telephone translations to be entered before the actual ports are assigned.

DEFINITY ECS Administration Without Hardware can be used on the following terminal types:

- Analog telephones
- Digital Communications Protocol telephones
- Hybrid telephones

Large DEFINITY ECS configurations support additional terminal types to those listed above. These include:

- Attendant consoles
- Voice/computers (such as Digital Communications Protocol terminals with voice and data capabilities)
- Data modules
- ISDN Basic Rate Interface telephones and computers
- Analog queue warning ports
- Announcement circuit packs

Terminal Translation Initialization

DEFINITY ECS provides terminal translation initialization, a feature that works with Administration Without Hardware. Terminal translation initialization associates the terminal translation data with a specific port location through the entry of a special feature-access code, a terminal translation initialization security code, and an extension number from at a terminal that is connected to a wired — but untranslated — jack.

Once a terminal is connected to an appropriate jack, the terminal user can dial the appropriate codes followed by a pre-translated extension number of an Administration Without Hardware terminal. The system will complete the administration of the terminal by associating the translation data with the port location and performing appropriate checks.

Terminal translation initialization reduces the labor associated with system initializations, major additions, rearrangement and changes, and building wiring. Translation data entry can be performed without knowledge of the physical layout of circuit packs. End-users can move their own station equipment if a building is wired to support it, reducing costs for station moves. Individual lines need only be wired to the correct type of port, rather than a specific port.

System administrators maintain control over the use of terminal translation initialization through security codes. By activating and deactivating security codes,

administrators can control who uses terminal translation initialization — and when.

Scheduling

DEFINITY ECS's functional scheduling allows you to specify the time a command will be executed or to specify that it should be executed on a periodic basis. Only commands that do not require user interaction after being entering on the command line (such as list, display, test) can be scheduled.

DEFINITY ECS also supports scheduling of "one shot" requests — commands that are executed only once and then removed from the scheduling queue automatically by the feature, such as *save translation* commands.

Functional scheduling enhances administration. For example, scheduling of save translations is particularly important when large numbers of translation changes are made during the day, ensuring that they will be saved to tape at the specified time. The "one shot" report is particularly useful for scheduling large print jobs at night that are normally run only once.

Basic Reporting

DEFINITY ECS has built-in capabilities for generating reports required for small, medium, and large systems. These reports are available without special hardware or software.

System Measurements reports supply information on the status of all communication facilities. These reports help determine the efficiency of resources, including but not limited to trunk groups, hunt groups, and the attendant group.

System Status reports supply information associated with the attendant group, major and minor alarms, and traffic measurements.

- The Recent Change History feature reports on the most recent administration and maintenance commands entered. DEFINITY ECS also supplies:
  - — New site data on the station form. New fields include the set color, building, floor, and headset. In addition, user-defined validation checks are provided for a subset of the site data items.
  - — Scaling enhancements, as well as a ranging and filtering capability, for large switches. These allow your system administrator to restrict data reporting to only the desired amount of switch parameters.

DEFINITY ECS also includes the following reports:

- Class-of-Restriction report lists the extensions that have a particular Class of Restriction value or that fall within a range of Class of Restriction values.

- Class-of-Service report lists the extensions that have a particular Class of Service value or that fall within a range of Class of Service values.
- Site Data report lists, by extension, the site data associated with stations in the system. Ranging and filtering capabilities are provided for selected site fields.

Performance Measurements

A number of performance measurements are available on DEFINITY ECS. These measurements are available in the form of switch-based reports for local or remote access, and can be collected for subsequent analysis and reporting by adjuncts and operation support systems using the operation support system interface protocol. These reports include:

- Call Coverage reports, which display measurements of the distribution of traffic offered to call-coverage groups. Separate reports for all calls and external calls are supplied. Each report has sections that define group attributes, provide a summary of coverage-group call dispositions, and show the disposition of traffic at each coverage point. You can select which coverage groups are monitored via administration. The fields are as follows:
  - — Group Attributes report the group number, number of principals, number and type of station (extension, Automatic Call Distribution) at each coverage point, and the number of ring cycles before the call is advanced to the next coverage point.
  - — Summary reports the number of calls offered, advanced to coverage, answered, and abandoned before being answered for all calls offered to the group and for external calls offered to the group.
- Coverage Points, which differs based on whether “All Calls” or “External Calls” is selected. The “All Calls” report shows detail data for all calls to the group; the “External Calls” report shows detail data for only the external calls offered to the group. For each coverage point in the group, the number of calls offered, abandoned while at that coverage point, and overflowing to the next coverage point are listed.

These measurements can be used to engineer group sizes at coverage points and to detect station user abuse of the call-coverage feature.

- Processor Occupancy report, which provides summary information on how heavily the processor is loaded. It includes fields giving peg counts of the number of various call types and total calling rates for the measurement period. The data fields of this report are:
  - — Processor occupancy for call processing (including the link subsystem) plus system management processes
  - — Call processing (including the link subsystem), system management, and packet interface processor occupancy

- — Total calls, number of station-to-station calls, number of incoming trunk calls, number of outgoing trunk calls, and number of tandem calls

These measurements are listed for the last hour, today's peak hour, and yesterday's peak hour.

Large systems offer additional measurements that help configure the switch, determine the switch's capacity for growth, and report unauthorized switch-access attempts. These measurements include:

- Traffic Summary report, which provides a performance summary of the switch with the following information:
  - — Processor occupancy for call processing and system management
  - — Attendant speed of service
  - — Total switch-network blocking probability, as well as blocking probability of the highest port network and highest center-stage link
  - — Total number of security violations as defined in the security violations report
  - — A list of the trunk groups that experienced blocking higher than an administered design grade of service
  - — Total trunks that are out of service
  - — Total number of CDR record buffer high-water-mark violations and buffer overflows
  - — Time stamps for when the following events last occurred:
    - Major alarm
    - The list of trunk groups to be studied with the detailed report were last changed
    - The list of coverage groups to be studied were last changed
    - The list of Automatic Alternate Routing/Automatic Route Selection routing patterns to be studied was last changed

These can be used to verify that your system and its users are not experiencing performance degradation due to overloaded switch resources.

- Attendant Position report, which lists the following:
  - — Attendant usage
  - — Number of calls answered
  - — Total time the attendant was available to answer a new call
  - — Average holding time on calls answered
- Security Violations report, which collects the following measurements:

- — System Management includes the number of successful and unsuccessful logins, the number of valid and invalid passwords, and the number of times a login name was valid but three successive invalid passwords were entered.
- — Call Processing lists the number of valid and invalid barrier codes entered, and the number of valid and invalid authorization codes entered for the total system, the stations on the system, all tie trunks, all remote access trunks, and the attendant consoles. In addition, the time and dial access code/extension from which the last ten violations occurred are recorded.
- — Maintenance Board lists the number of valid and invalid attempts to access the maintenance board.

- Tandem Traffic report, which provides information on facilities that serve tandem traffic.

The following measurements are useful in helping you evaluate the network engineering design for possible reconfiguration. They can help you decide how to reconfigure networks for lower-cost operation.

- Hunt Group Measurements lists various information including the number of calls that overflowed the group queue.
- Automatic Route Selection Pattern Measurements collects information on Automatic Route Selection patterns from when the report was administered into the measured pattern list until it is removed from the measured pattern list.
- Trunk Group Detailed Measurements reports on the traffic on a selected subset of trunk groups for a sequence of 24 measurement intervals whose length is customer-selectable between the options of 15 minutes, 30 minutes, and one hour. The report is divided into two sections:
  - — Group Identification includes the trunk group number, size, type, direction, and size.
  - — Measurements lists total usage, maintenance usage, total calls, incoming calls, tandem calls, group overflow, calls queued, queue overflow, percentage of all trunks busy, and percentage of outgoing blocking.

The following measurements and reports are needed for engineering and load balancing a large switch. These measurements include:

- Blockage Study report, which shows the blockages that occur for Time Division Multiplexing attempts and for Center Stage Switch connections for each port network and the blockages that occur between each pair of switch nodes.
- Port Network and Link Usage is used in balancing load between port networks and in engineering links (Expansion Port Network/Switch Node), especially remote Expansion Port Networks over Digital Signal Level 1

links. This report lists the measurements for all calls, intercom calls, incoming trunk calls, outgoing trunk calls, and tandem calls for each port network.

All of these measurements are accessible to an external host via the operation support system interface.

G3 Management Applications Reports and Data Acquisition Utilities

Through the G3-Management Applications, which run on UNIXWARE-based personal computers, DEFINITY ECS supports reporting and data acquisition not available through the switch-based reports. This supports the consolidation and formatting functions that large organizations need. When excess data surpass a multiple-screen display capability, the ranging, sorting, and filtering capability provided by standard report-generation programs allows to restrict reports to only the desired data. The data acquisition feature supports two capabilities:

- The ability to collect data from the switch via the operation support system interface
- The ability to use personal computer-based software, such as standard database programs or report-generation packages, to create custom reports from G3-Management Applications

For the G3-Management Applications reporting capability, data from selected switch-based reports is accessible on the G3-Management Applications in standard personal computer file format (such as ASCII G3-Management Applications). G3-Management Applications reporting allows you to do the following:

- Create files of switch data on the personal computer in a format compatible with available report-generation programs, such as Informix.
- Substitute the DEFINITY ECS-generated field headers with customer-defined headers
- Administer the file format, including which character to use as a field separator (space, comma, etc.) and which characters to use as a field value delimiter (quotes, no character, etc.)

ECS Reports Generator

The ECS Reports Generator is an easy to use, graphical reporting tool that does the following:

- Maintains a location database of all the systems managed (in addition to the DEFINITY ECS, it supports Lucent Technologies System 75, G1 and G3 systems)
- Provides automated connections via pre-defined scripts to the various systems

- Captures all pre-defined reports immediately, or schedules off-peak downloading to your personal computer
- Creates faxable order forms and keeps a record of all purchases for all systems in the network
- Provides cut-through administration capability with a 513 terminal emulator
- Provides flexible sorting and formatting options for report display and export to other applications
- Easy to navigate interface, with simple setup procedures

The scheduler can be used for off-peak, automatic polling of systems for daily reports required for monitoring your DEFINITY ECS environment. It can also be set up to invoke special scripts or personal computer applications.

The ECS Reports Generator produces all standard reports, plus the following.

- Unused Extension Report shows all unused extensions.
- Configuration Pictorial graphically depicts your system, with cabinet, carrier, and slot representation. It maps the station data to the configuration data so you can easily determine where stations are assigned for a port on a circuit pack. You can easily see which ports are free on which slots and what the port names are.
- Configuration Summary provides a total system inventory with totals of circuit packs in use and the total number of free ports. It also recommends ways to consolidate and conserve resources.
- Station Reports allow you to sort station data in a variety of columns.
- Phone Directory allows you to create and maintain a directory list for general distribution. You can define some extensions as unlisted, and they will not be printed in the directory.
- Out of Service Trunks notifies you during off-peak hours of any trunks that are not functioning.

All of these custom reports can export data formatted for use by other database management applications.

Call Charge Information

DEFINITY ECS provides two ways to know the approximate charge for outgoing calls:

- Advice of Charge — For ISDN trunks

  Advice of Charge collects charge information from the public network for each outgoing call. Charge advice is a number representing the cost of a call; it is recorded as either a charging or currency unit.

- Periodic Pulse Metering — For non-ISDN trunks

  Periodic Pulse Metering accumulates pulses transmitted from the public network at periodic intervals during an outgoing call. At the end of the call, the number of pulses collected is the basis for determining charges.

Call-charge information helps you to account for the cost of outgoing calls without waiting for the next bill from your network provider. This is especially important in countries where telephone bills are not itemized. You can also use this information to let employees know the cost of their phone calls, encouraging them to save money on toll calls.

Call Detail Recording

Also included in the timely and efficient management of your communications system is the management and control of call costs. Call Detail Recording allows you to monitor and analyze call patterns and usage in your system. DEFINITY ECS has enhanced the Call Detail Recording capabilities available to you.

Call Detail Recording Features

DEFINITY ECS enhances Call Detail Recording with the following new capabilities:

- Distinguish voice from data on trunk calls
- Determine if a data call used a conversion resource, such as a modem pool
- Choose whether to record the vector directory number in the “Dialled Number” field of the Call Detail Recording record, or record either the split or the agent extension in the same field
- Allow Call Detail Recording records to be generated for internal calls (calls to and from a set of extensions, including data endpoints) so administered (a maximum of 500 extensions in large configurations)
- With Call Privacy, allow up to seven digits of the dialled number to be blanked from the Call Detail Recording record

- Use a second Call Detail Recording port for sending Call Detail Recording data to a second source
- Provide Call Detail Recording call splitting, which allows incoming and outgoing calls to be split into separate call records in order to track calls that transferred to other internal parties

DEFINITY ECS includes the Variable Format Records feature, which provides a flexible means of incorporating new fields in the call detail record as new switch features and new Call Detail Recording devices become available. The variable format allows you to define a record in terms of its content (from a set of available data elements), the position of its fields, and the spacing between the fields. This method can be used to construct the 15-, 18-, and 24-word standard formats and custom formats.

If calls come in while the Call Detail Recording link is down and the buffer is filled to maximum, DEFINITY ECS gives you the following administrable call-record handling options:

a. Block the calls with reorder
b. Allow the calls to overwrite records
c. Route the calls to an attendant with the option to proceed as a non-Call Detail Recording call

As you can see, DEFINITY ECS call-record handling capabilities are designed to be flexible, adapting to meet your present and future business needs.

Call Detail Recording Devices

The following output devices are supported by DEFINITY ECS:

- Local storage devices such as the Call Detail Recording Unit/S, and any customer-provided storage device with an RS-232C interface
- Processing devices — such as the Lucent Technologies Call Accounting System Plus, Cost Allocator, or host processors — that are supported over an RS-232C interface with XON/XOFF flow control
- Asynchronous ASCII printers with RS-232C interface

The enhanced variable format records feature capability in DEFINITY ECS supports any customer-defined data presentation, and therefore can support any devices over an RS-232C interface.

Call Accounting Systems

Several options are available to you for call accounting, depending on what type of system administration tools you are using.

Call Accounting System for Windows

The Call Accounting System for Windows allows you to generate comprehensive and accurate accounting reports using the familiar Microsoft Windows environment, which allows you to run several tasks at once. Detailed or summary reports can be expressed in two or three dimensional, color charts and graphs or in text files suitable for downloading to other applications.The optional toll fraud detection module allows you to detect fraudulent use of your long-distance services.

You can generate reports that identify:

- Most frequently dialed numbers
- Most expensive calls
- Longest duration calls

In addition, you can search the accounting data for a great variety of information, including dialed numbers, partial numbers, dates, times, call types, departments, and calling extensions.

All this enables you to reduce telephone expenses, optimize resources, assign costs, and identify abuse. The Call Accounting System for Windows helps you to clearly understand your telephone expenses and convey that understanding to others.

You can define up to five levels of reporting hierarchy to which you can assign costs. The system archives your data for one accounting period. A flexible markup capability allows service businesses to adjust call pricing for each client.

Call Accounting System for Windows can generate twenty standard historical or real-time reports from as many as 100 locations. An individual system is capable of polling different types of call detail storage units or other Call Accounting System for Windows systems. The remote systems forward call records and alarms as they are generated.

A traffic engineering option allows you to monitor trunk usage, calling patterns, incoming traffic, and outgoing calls by area code. This allows you to analyze trends summarizing how your equipment is being used.

Call Accounting System for windows is widely compatible and requires little maintenance, even while collecting data, generating reports, and managing remote data collection sites.

Call Accounting System Terminal

Lucent Technologies Call Accounting System Terminal is an easy-to-install hardware and software package that allows you to assign expenses to as many as three organizational levels. For example, you might assign costs at the department, cost center, or extension level.

The system makes it easy for you to generate a wide variety of accounting and system reports. For example, the Facility Grade of Service Report helps identify the number of number of trunk lines needed to respond efficiently to incoming calls. You can also generate toll fraud reports and alarms that identify excessive personal calls, unauthorized calls, and calls to expensive dial-up recordings.

INTUITY Call Accounting System

If you are using any of the INTUITY voice messaging products, the INTUITY Call Accounting System is probably best call accounting solution for you. The system works exclusively with INTUITY products, which reside on MAP/40 or MAP/100 computers. (For more information on INTUITY products, see Chapter 9, "Voice Processing Solutions".) Offering many of same features as the Call Accounting System for Windows (described in the previous section), the system also serves to help integrate your INTUITY applications.

You can use the INTUITY Call Accounting System to optimize DEFINITY ECS system resources, detect toll fraud, and allocate costs. More creative applications of the system's reporting capabilities include:

- Measuring response of advertising campaigns by assigning an account number for the media (radio, television, etc.) that prompted incoming calls.
- Increasing productivity by tracking the costs of telemarketing and customer service calls
- Detecting and finding the cause of abandoned calls

The system can handle up to 500 extensions.

Security

Besides the toll fraud detection options available with DEFINITY Call Accounting Systems (described in the previous section), DEFINITY ECS includes many other security features, some of which are an integral part of the system design.

Security Violation Notification

Security violation notification identifies potential hackers' attempts to access the DEFINITY ECS. It notifies you when the number of invalid barrier-code attempts or invalid login attempts is greater than the administered threshold.

A monitor report displays the last 16 invalid barrier-code attempts and the last 16 invalid login attempts. This report is automatically updated every 30 seconds.

Call Restrictions

By dialing an access code, administrators and attendants have the ability to restrict users from making or receiving certain types of calls. There are five restrictions:

- Outward — User cannot place external calls.
- Station-to-station — User cannot place or receive internal calls.
- Termination — User cannot receive any calls (except priority calls).
- Toll — User cannot place toll calls.
- Total — User can neither place nor receive any calls.

Features

A

This appendix provides a description of each feature of DEFINITY ECS arranged in the following categories:

Not all features are available with each model of DEFINITY ECS. Please see Appendix B, "System Capacity Limits" for information on feature availability by model. In addition, not all system applications or adjunct applications may be available in your country.

This appendix discusses all DEFINITY capabilities available anywhere. Please check with your local Lucent Technologies representative for further information about what is available in your country.

Each feature is described briefly, though most DEFINITY ECS features have many complex capabilities and options. The *DEFINITY ECS Release 6 Administration and Feature Description* manual (555-230-522) describes each feature in detail and provides complete implementation and administration information. Some features are systems of their own and have their own documentation, such as Call Detail Recording, AUDIX, and Call Management System. See your local distributor for more information on each of these features.

Automatic Routing Features

DEFINITY ECS provides a variety of automatic-routing features for public and private networks. Automatic Alternate Routing (AAR) and Automatic Route Selection (ARS) are the foundation for these automatic-routing features. They route calls based on the preferred (normally the least expensive) route available at the time the call is placed. Generally, AAR routes calls over a private network and ARS routes calls using the public network numbering plan. However, both AAR and ARS support public and private networks. You can use the other features listed in this section when you use AAR and ARS.

Automatic Alternate Routing (AAR)

Allows private network calls to originate and terminate at one or many locations without accessing the public network. When you dial an access code and phone number, AAR selects the most desirable route for the call and performs digit conversion as necessary. If the first choice route is unavailable, another route is chosen automatically.

The numbers you call using AAR are normally private-network numbers. However, you can call a public-network number, a service code, an international number, operator access code, or an operator-assisted dialing number. With AAR and Subnet Trunking, you have a convenient way to place international calls to frequently-called foreign cities. Such calls route as far as possible over the private network, and then access the public network. This saves toll charges and allows you to use your private network as much as possible.

Automatic Route Selection (ARS)

ARS selects carriers automatically and routes calls inexpensively over the public network. When there are one or more long-distance carriers and wide-area telecommunications services (WATS) provided, DEFINITY ECS selects the most preferred route for the call. Long-distance carrier-code dialing is not required on routes selected by the system. You assign long-distance carrier-codes and DEFINITY ECS translates them. The system inserts codes as needed to guarantee automatic-carrier selection. ARS can route calls to a variety of types-of-numbers and access a variety of types of trunk groups.

AAR/ARS Overlap Sending

DEFINITY ECS supports overlap sending for AAR and ARS calls that are routed over ISDN-PRI trunk groups. ISDN-PRI call-address information is sent one digit at a time instead of in one block. In countries with complex public-network numbering plans, this allows for a significant decrease in call setup time. When overlap receiving is enabled, this is especially significant for tandemed calls.

AAR/ARS Partitioning

Allows AAR and ARS to be partitioned into 8 user groups within a single DEFINITY ECS and provides individual routing treatment for each of these user groups.

User groups share the same Partition Group Number, which indicates the choice of routing tables that are used on a particular call. Each Class of Restriction is assigned a specific Partition Group Number or Time of Day specification. Different classes of restriction may be assigned the same Partition Group Number.

Alternate Facility Restriction Levels

Allows DEFINITY ECS to adjust facility restriction levels or authorization codes for lines or trunks. Each line or trunk is normally assigned a facility restriction level. With this feature, alternate facility restriction levels are also assigned. Attendants can change to the alternates, thus changing access to lines and trunks. You might want to use this feature to disable most long-distance calling at night, for example, to prevent unauthorized staff from making long-distance calls.

⚠ CAUTION:

This feature may change the AAR and ARS routing preferences. Using it on tandem and tie-trunk applications affects entire networks. Calls that are part of a cross-country private network may be blocked.

Facility Restriction Levels and Traveling Class Marks

Allows certain calls to specific users, while denying the same calls to other users. For example, certain users may be allowed to use central office trunks to other corporate locations while other users may be restricted to less expensive private-network lines. You can administer up to eight levels of restriction for users of AAR and ARS.

Generalized Route Selection

Provides voice and data call-routing capabilities. You use it to select not only the least-cost routing, but also optimal routing over the appropriate facilities. It enhances AAR and ARS by providing additional parameters in the routing decision and maximizing the chance of using the right facility to route the call. Also, if an endpoint incompatibility exists, it provides a conversion resource (such as a modem from a modem pool) to attempt to match the right facility with the right endpoint.

Look Ahead Routing

Provides an efficient way to use trunking facilities. It allows you to continue to try to reroute an outgoing ISDN-PRI call that is not completing. When DEFINITY ECS receives a cause value that indicates congestion, Look Ahead Routing tells the system what to do next. For each routing preference, you can indicate if the next routing-preference should be attempted or if the current routing-preference should be attempted again.

Subnet Trunking

Modifies the number you dial so an AAR or ARS call can route over different trunk groups that may terminate in switches with different dial plans. Subnet Trunking inserts digits, deletes digits, pauses, and/or waits for dial tone in digit outpulsing, as required, so calls route:

- To or through a remote switch
- Over Tie trunks to a private network switch
- Over CO trunks to the serving CO

Subnet Trunking is required on calls routing to or through a remote switch, regardless of the call's destination.

Time of Day Routing

Provides the most economical routing of ARS and AAR calls. This routing is based on the time of day and day of the week that each call is made. Up to 8 TOD routing plans may be administered, each scheduled to change up to 6 times a day for each day in the week.

This allows you to take advantage of lower calling rates during specific times of the day and week. In addition, companies with locations in different time zones can use different locations that have lower rates at different times of the day or week. This feature is also used to change patterns during the times an office is closed in order to reduce or eliminate unauthorized calls.

Basic Features

The following features come standard with DEFINITY ECS.

Abbreviated Dialing

Provides lists of stored numbers you can use to:

- Place local, long-distance, and international calls
- Activate features
- Access remote computer equipment

You simply dial the list number and the one-, two-, or three-digit number associated with the phone number you want. The number is then automatically dialed by the system. A frequently called number can be stored on an abbreviated dialing button that you need only press once to make the call.

Administered Connections

Automatically establishes an end-to-end connection between two access or data endpoints based on administered attributes. This feature provides capabilities such as alarm notification, including an administrable alarm type and threshold; automatic restoration of connections established over a Software-Defined Data Network; ISDN-PRI trunk group [service may be referred to as ISDN-PRI (AC/AE) Service]; scheduled as well as continuous connections; and administrable-retry interval for failed connection attempts.

Administrable Language Displays

Allows the messages that appear on telephone display units to be shown in the language spoken by the user. These messages are available in English (the default), French, Italian, Spanish, or one other user-defined language. The language for display messages is selected by each user. The feature requires 40-character display telephones.

Administration Without Hardware

Allows you to administer telephones that are not yet physically present on the system. This feature works the same as administration with hardware: when stations are moved, user-activated features such as call forwarding and send all calls are preserved and functional. This greatly facilitates the speed of setting up and making changes to the telephones on the system.

Alphanumeric Dialing

Allows you to place data calls by entering an alphanumeric name rather than a long string of numbers.

Alternate Operations Support System Alarm Number

Allows you to establish a second number for the system to call when an alarmable event occurs. This feature is useful for alerting a second support organization, such as INADS or OneVision.

Answer Detection

For purposes of call-detail recording, it is important to know when the called party answers a call. DEFINITY ECS provides three ways to determine whether the far end has answered an outgoing call.

- Answer Detection — A call-classifier board detects tones and voice-frequency signals on the line and determines whether a call has been answered. This method is fairly accurate.
- Network Answer Supervision — The central office (CO) sends back a signal to indicate that the far end has answered. If a call has traveled over a private network before reaching the CO, the signal is transmitted back over the private network to the originating system. This method is extremely accurate, but is not available in the United States over CO, FX, or WATS trunks.
- Answer Supervision by Timeout — You set a timer for each trunk group. If the caller is off-hook when the timer expires, the system assumes that the call has been answered. This is the least accurate method. Calls that are shorter than the timer duration do not generate call records, and calls that ring for a long time produce call records whether they are answered or not.

Attendant Auto-Manual Splitting

Allows an attendant to announce a call or consult privately with the called party without being heard by the calling party on the call. It splits the calling party away so the attendant can confidentially determine if the called party can accept the call.

Attendant Backup Alerting

Notifies backup attendants that the primary attendant cannot pick up a call. It provides both audible and visual alerting to backup stations when the attendant queue reaches its queue warning level. When the queue drops below the queue warning level, alerting stops. Audible alerting also occurs when the attendant console is in night mode, regardless of the attendant queue size.

Attendant Call Waiting

Allows an attendant to let a single-line telephone user who is on the phone know that a call is waiting. The attendant is then free to answer other calls. The attendant hears a call waiting ringback tone and the busy telephone user hears a call waiting tone. This tone is heard only by the called telephone user.

Attendant Calling of Inward Restricted Stations

A telephone with a Class of Restriction that is inward restricted cannot receive public network, attendant-originated, or attendant-extended calls. This feature allows you to override this restriction.

Attendant Console

A digital call-handling station with push-button control used not only to answer and place calls, but also to manage and monitor some system operations.

Attendant Control of Trunk Group Access

Allows an attendant to control trunk groups and prevents telephone users from directly accessing a controlled trunk group. This allows the attendant to monitor the use of these trunk groups. By watching the lamps associated with the trunk groups, the attendant can determine if the number of busy trunks in a specific trunk group has reached a preset warning level and if all trunks in a specific trunk group are busy. The attendant can then handle other calls to these trunk groups accordingly.

Attendant Crisis Alert

Visibly and audibly alerts attendants when an emergency call is placed. The feature indicates from where an emergency call is made, which allows the attendant to direct emergency-service response to the caller. Though often used in the hospitality industry, it can be set up to work with any standard attendant console.

Audible alerting sounds like an ambulance siren. Visual alerting consists of flashing of the crisis-alert button lamp and display of the caller name and extension. When crisis alerting is active, the console is placed in position-busy mode so that no other incoming calls interfere with the emergency call. The console can still originate calls. The attendant must press the position-busy button to unbusy the console and the crisis-alert button to deactivate audible and visual alerting.

Attendant Direct Extension Selection With Busy Lamp Field

Allows the attendant to keep track of extension status — whether the extension is idle or busy — and to place or extend calls to extension numbers without having to dial the extension number. The attendant can use this feature in two ways: using standard Direct Extension Selection access, or using enhanced Direct Extension Selection access.

Attendant Direct Trunk Group Selection

Allows the attendant direct access to an idle outgoing trunk by pressing the button assigned to the trunk group. This feature eliminates the need for the attendant to memorize, or look up, and dial the trunk access codes associated with frequently used trunk groups. Pressing a labelled button selects an idle trunk in the desired group.

Attendant Display

Shows call-related information that helps the attendant to operate the console. Also shows personal service and message information. Information is shown on the alphanumeric display on the attendant console. Attendants my select one of several available display message languages: English, French, Italian, or Spanish. In addition, your company may define one additional language for use by users and attendants on their display.

Attendant Intrusion (Call Offer)

Allows an attendant to enter an existing call to inform the person being called about a message or another call. Upon intrusion, tone may be applied if administered.

Attendant Override of Diversion Features

Allows an attendant to bypass diversion features such as Send All Calls and Call Coverage by putting a call through to an extension even when these diversion features are on. This feature, together with Attendant Intrusion, can be used to get an emergency or urgent call through to a telephone user.

Attendant Priority Queue

Places incoming calls to the attendant in an orderly queue when these calls cannot go immediately to the attendant. This feature allows you to define twelve different categories of incoming attendant calls, including emergency calls, which are given the highest priority.

Attendant Recall

Allows users to recall the attendant when they are on a two-party call or on an Attendant Conference call held on the console. Single-line users press the Recall button or flash the switchhook to recall the attendant. Multiappearance users press the Conference or Transfer button to recall the attendant and remain on the connection when either button is used.

Attendant Release Loop Operation

Allows the attendant to hold a call off the console if the call cannot immediately go through to the person being called. A timed reminder begins once the call is on hold. If the call is not answered within the allotted time, the call returns to the queue for the attendant. Timed reminders attempt to return the call to the attendant who previously handled it. Only when the original attendant is unavailable are calls returned to the queue.

Attendant Serial Calling

Enables an attendant to transfer trunk calls that return to the same attendant after the called party hangs up. The returned call can then transfer to another station within the switch. This feature is useful if trunks are scarce and Direct Inward Dialing services are unavailable. An outside caller may have to redial often to get through because trunks are so busy. Once callers get through to an attendant they can use the same line into the switch for multiple calls. The attendant's display shows if an incoming call is a serial call.

Audible Message Waiting

Places a stutter at the beginning of the dial tone when a telephone user picks up the phone. The stutter dial tone indicates that the user has a message waiting. This feature is particularly useful for visually impaired people who may not be able to see a message light. It is often used with telephones that have no message waiting lights, but may not be available in countries that restrict the characteristics of dial tones provided to users.

Audio Information Exchange Interface

AUDIX is a message-handling system for recording and distributing spoken messages or voice mail. Stored voice prompts guide users in creating, sending, retrieving, answering, saving, and forwarding spoken messages.

Several versions of AUDIX are available: DEFINITY AUDIX is comprised of circuit packs resident in the switch. INTUITY AUDIX is external to the DEFINITY ECS and connected to it by station lines and data links. AUDIX systems can also be networked through switches or other AUDIX machines. They rely on a data link between the AUDIX adjunct on the switch.

Authorization Codes

Authorization Codes extend calling-privilege control and enhance security for remote-access callers.

Authorization codes may be used to:

- Override facility restriction levels assigned to originating stations or trunks
- Restrict individual incoming tie trunks and remote-access trunks from accessing outgoing trunks
- Track CDR calls for cost-allocation purposes
- Provide additional security control

Auto Start and Don't Split

Auto Start allows the attendant to make a telephone call without pushing the start button first. If the attendant is on an active call and presses digits on the keypad, the system automatically splits the call and begins dialing the second call. The Don't Split feature deactivates the Auto Start feature and allows the sending of touch tones over the line for the purposes of such things as picking up messages.

Automatic Callback

Allows internal users who placed a call to a busy or unanswered internal telephone to be called back automatically when the called voice terminal becomes available.

When a user activates Automatic Callback, the system monitors the called telephone. When the called telephone becomes available to receive a call, the system originates the Automatic Callback call. The originating party receives priority ringing. The calling party then lifts the handset and the called party receives the same ringing provided on the original call.

Automatic Circuit Assurance

Assists in identifying possible trunk problems. The system maintains a record of the performance of individual trunks and automatically calls a designated user when a possible failure is detected. This feature provides better service through early detection of faulty trunks and consequently reduces out-of-service time.

Automatic Incoming Call Display

Displays information about an incoming call while you are using a display telephone.

Automatic Transmission Measurement System

Measures voice and data trunk facilities for satisfactory transmission performance. The measurement report contains data on trunk signal loss, noise, signaling return loss, and echo return loss. Acceptable performance, the scheduling of tests, and report contents are administrable.

Block Collect Call

Blocks collect calls. This feature is used primarily in Brazil.

Bridged Call Appearance — Multi-Appearance Telephone

Allows calls to be handled from more than one telephone. A bridged call appearance is set up by administering a primary extension and the button number associated with it on a two-lamp button on another telephone. One way this feature is most often used is by secretaries or assistants who answer or handle calls to the primary extension (an executive, for example). When the primary extension receives a call, the bridged call appearance flashes or rings and the call can be handled as if the primary extension user was answering it.

Bridged Call Appearance — Single-Line Telephone

Allows single-line telephones users to have a bridged appearance on a multi-appearance phone.

Bulletin Board

The bulletin board is a place on the switch where you can post information and receive messages from other switch users, including Lucent Technologies personnel. Anyone with appropriate permissions can use the bulletin board for everyday messages. In addition, Lucent Technologies personnel can leave high-priority messages, which are displayed on the first 10 lines of the bulletin board.

Busy Verification of Terminals and Trunks

Allows attendants and users of multi-appearance telephones to make test calls to trunks, telephones, and hunt groups to check the status of an apparently busy resource. With this feature, an attendant or multifunction telephone user can distinguish between a telephone that is truly busy and one that only appears busy because of some problem. You can also use the feature to quickly identify faulty trunks.

Call Charge Information

DEFINITY ECS provides two ways to know the approximate charge for calls made on outgoing trunks:

- Advice of Charge — For ISDN trunks

  Advice of Charge (AOC) collects charge information from the public network for each outgoing call. Charge advice is a number representing the cost of a call; it is recorded as either a charging or currency unit.

- Periodic Pulse Metering — For non-ISDN trunks

  Periodic Pulse Metering (PPM) accumulates pulses transmitted from the public network at periodic intervals during an outgoing trunk call. At the end of the call, the number of pulses collected is the basis for determining charges.

Call-charge information helps you to account for the cost of outgoing calls without waiting for the next bill from your network provider. This is especially important in countries where telephone bills are not itemized. You can also use this information to let employees know the cost of their phone calls, and so encourage them to help manage the company's telecommunications expenses.

NOTE:
This feature is not offered by the public network in some countries, including the United States.

Call Coverage

Call Coverage provides automatic redirection of calls that meet specified criteria to alternate answering positions in a Call Coverage path. A coverage path can include any of the following: a telephone, an attendant group, a uniform call distribution hunt group, a direct department calling hunt group, an automatic call distribution hunt group, a voice messaging system, or a coverage answer group established to answer redirected calls.

In addition to redirecting a call to a local answering position, you can administer Call Coverage to:

- Redirect calls based on time-of-day
- Redirect calls to a remote location
- Allow users to change back and forth between two lead-coverage paths from either an on- or off-site location

Call Detail Recording

Records detailed call information on incoming and outgoing calls for the purpose of call accounting and sends this call information to a call detail recording output device. You can specify the trunk groups and extensions for which you want records to be kept as well as the type of information to be recorded. You can keep track of both internal and external calls. This application contains a wide variety of administrable options and capabilities.

Call Forwarding

Call Forwarding provides four functions:

- Call Forwarding All Calls — Allows calls to be forwarded to an internal extension, external (off-net) number, an attendant, or an attendant group.
- Call Forwarding Override — Allows the user at the forwarded-to extension to override Call Forwarding and either initiate a call or transfer a call back to the forwarded-from extension.
- Call Forward Busy/Don't Answer — Allows calls to be forwarded when the called extension is busy or when the call is not answered after an administrable interval. If the extension is busy, the call forwards immediately. If the extension is not busy, the incoming call rings the called extension, then forwards only if it remains unanswered longer than the administered interval.
- Call Forwarding Off Net — Allows calls forwarded off net to be tracked for busy or no-answer conditions. The system brings the call back for further call-coverage processing if specified conditions are met. This feature is particularly useful for telecommuters, who can have their on-site office calls forwarded to their home offices.

Call Park

Allows you to put a call on hold and then retrieve a call from any other telephone on the system. This is helpful when you are on a call and need to go to another location for information. It also allows you to answer a call from any telephone after being paged by a telephone user or an attendant.

Call Pickup

Along with Directed Call Pickup, allows you to answer calls for other telephones within your specified call pickup group. Directed Call Pickup allows you to pick up any call on the DEFINITY ECS system. With this feature, you do not have to leave your telephone to answer a call for a nearby telephone. You simply dial an access code or press a Call Pickup button.

Call Waiting Termination

Allows for users of single-line telephones who are on a call to be notified of a second call. This feature enables the second call to wait and sends a distinctive call waiting tone to the user who is being called.

Class of Restriction

Defines many different classes of call origination and termination privileges. Systems may have no restrictions, only a single class of restriction, or may have as many classes of restrictions as necessary to effect the desired restrictions. Many different types of classes of restriction can be assigned to many types of facilities on the switch. For example, you can use a calling-party COR to prevent callers from accessing the public network.

Class of Service

Defines whether or not telephone users can access the following features and functions: Automatic Callback, Call Forwarding, Data Privacy, Priority Calling, Restrict Call Forwarding Off-Net, Call Forward Busy/Don't Answer, Personal Station Access, Extended Forwarding and Busy/Don't Answer, Trunk-to-Trunk Transfer Restriction Override, Off-Hook Alert, Console Permission, or Client Room.

Code Calling Access

Allows attendants, users, and tie trunk users to page with coded chime signals. This feature is helpful for users who are often away from their telephones or at a location where a ringing telephone might be disturbing.

Conference — Attendant

Allows an attendant to set up a conference call for as many as six conferees, including the attendant. Conferences from inside and outside the system can be added to the conference call.

Conference — Terminal

Allows multi-appearance telephone users to set up six-party conference calls without attendant assistance. Single-line telephone users can set up three-party conference calls without attendant assistance.

Consult

Allows a covering user, after answering a call received through Call Coverage, to call the called party for private consultation. Consult can be used to let a covering user ask the principal if they want to speak with the calling party.

Coverage Callback

Allows a covering user to leave a message for the called party to call back the person who called.

Coverage Incoming Call Identification

Allows multi-appearance telephones users without a display in a Coverage Answer Group to identify an incoming call to that group.

Customer-Provided Equipment Alarm

Provides you with an indication that a system alarm has occurred and that the system has attempted to contact a service organization. A device that you provide, such a lamp or a bell, is used to indicate the alarm situation. You can administer the level of alarm about which you want to be notified.

Data Call Setup

Enables the setting up of data calls using a variety of methods, such as: keyboard dialing, telephone dialing, Hayes command dialing, permanent switched connections, administered connections, automatic calling unit interface, and hotline dialing. Data Call Setup is provided for both DCP and ISDN-BRI telephones.

Data Hot Line

Provides for automatic placement of a data call when the originator hangs up. Data Hot Line may be used for security purposes. This feature offers fast and accurate call placement to commonly called data endpoints. Data terminal users who constantly call the same number can use Data Hot Line to automatically place the call when they hang up the telephone.

Data Privacy

Protects analog data calls from being disturbed by any of the system's overriding or ringing features. Data Privacy is activated when you dial an activation code at the beginning of the call.

Data Restriction

Like Data Privacy, this feature protects analog data calls from being disturbed by any of the system's overriding or ringing features. It is administered at the system level to selected analog and multi-appearance telephones and trunk groups.

Default Dialing

Provides data terminal users who dial a specific number the majority of the time a very simple method of dialing that number. This feature enhances Data Terminal (Keyboard) Dialing by allowing a data terminal user to place a data call to a preadministered destination in several different ways, depending on the type of data module. Data Terminal Dialing and Alphanumeric Dialing are unaffected.

Demand Print

Allows you to print your undelivered messages without calling the Message Center.

Dial Access to Attendant

Allows you to reach an attendant by dialing an access code. The attendant can then extend the call to a trunk or to another telephone.

Dial Plan

The dial plan is the system's guide to digit translation. When the system receives dialed digits, the system must know what to expect next based on the digits received so far. For example, if you dial 4, the dial plan tells the system how many more digits to expect before the call is processed.

Dialed Number Identification Service

Displays, for a called party or answering position, the service or product associated with an incoming call. You administer what the system displays.

Distinctive Ringing

Helps users and attendants distinguish between various types of incoming calls by distinctive ringing patterns. You can set up ringing patterns to indicate many different types of calls: internal, external, and priority calls, for example.

Dual DCP I-Channels

Support the use of dual DCP I-channels for AUDIX networking. In this case, networking refers to the ability to send data files between AUDIX systems, not to communications with the switch.

Emergency Access to the Attendant

Provides for emergency calls to be placed to an attendant. These calls can be placed automatically by the system or can be dialed by system users. Emergency access calls can receive priority handling by the attendant.

Enhanced Abbreviated Dialing

Supplements Abbreviated Dialing by providing one enhanced number per system. Enhanced number lists can contain any number or dial access code. System Administrators designate privileges for group number lists, system number lists and enhanced number lists. With privileged lists, users can access otherwise-restricted numbers (e.g., Stations without long-distance access can be programmed to access specified long-distance numbers.)

Enhanced Voice Terminal Display

The Enhanced Voice Terminal Display feature allows you to choose the character set that you want to see in DEFINITY ECS softkeys and display terminals. In addition to the standard Roman character set, you can choose either the Katakana or characters used for most European languages.

Extended User Administration of Redirected Calls

Allows users to change their lead-coverage path or their call forwarding from any on-site (local) or remote (off-site) location.

External Device Alarming

Allows you to assign analog ports to alarm interfaces for external devices. You can specify a port location, information to identify the external device, and the alarm level to report when a contact closure occurs.

Facility Busy Indication

Allows users of multi-appearance telephones to see which lines, trunk groups, terminating extension groups, hunt groups, or paging zones (called resources or facilities) are busy. When the lamp associated with the resource is lit, the resource is busy.

You can store extension numbers, trunk group access codes, and Loudspeaker Paging access codes in a Facility Busy Indication button. The Facility Busy Indication button provides direct access to any of the facilities.

Facility Test Calls

Allows telephone users to make test calls to access specific trunks, dual tone multifrequency receivers, time slots, and system tones. The user dials an access code and makes the test call to make sure the facility is operating properly. Security measures are included to prevent unauthorized use.

Fiber Link Administration

Port cabinets are connected via direct fiber links or through fiber links to a center-stage switch to provide the connections required for voice and data information transfer. The center-stage switch is composed of switch node carriers that are interconnected by fiber links. It provides both circuit-switched and packet-switched connections. Fiber Link Administration creates the translation data defining these links by identifying the endpoint pairs for each link. Endpoints can be an expansion interface or a switch-node-interface circuit pack.

Go to Cover

Allows users who call another internal extension to send the call directly to coverage.

Group Listen

Simultaneously activates your speakerphone in listen only mode and your handset or headset in listen and speak mode. This allows you to serve as spokesperson for a group. You can participate in a conversation while everyone else in the room is listening to what is said.

Group Paging

Allows you to make an announcement to a group of people via their speakerphones. The speakerphones are automatically turned on when you begin the announcement. The recipients can listen to the message via the handset if they wish, but they cannot speak to you in return.

Hold

Allows you to disconnect from a call temporarily, use your telephone for other call purposes, and then return to the original call.

Hold — Automatic

Allows attendants and multi-function telephone users to alternate easily between two or more calls. For example, with automatic hold, selection of a second call appearance automatically puts the active call (if any) on hold and makes the second call appearance active. This feature can be activated on a system-wide basis only. When automatic hold is not activated, the depression of the second call appearance would drop the first call.

Hunt Groups

A group of extensions that can handle multiple calls simultaneously to a single phone number. For each call to the phone number, the system hunts for an available extension in the group and connects the call to that extension.

A hunt group is especially useful when you expect a high number of calls to a particular phone number. A hunt group might consist of people trained to handle calls on specific topics. For example, the group might be:

- A benefits department within your company
- A service department for products you sell
- A travel reservations service
- A pool of attendants

In addition, a hunt group might consist of a group of shared telecommunications facilities. For example, the group might be:

- A modem pool
- A group of data-line circuit ports
- A group of data modules

Individual Attendant Access

Allows you to call a specific attendant console. Each attendant console can be assigned an individual extension number.

Integrated Directory

Allows users with display-equipped telephones to access the system database, use the touch-tone buttons to enter a name, and retrieve an extension number from the system directory. The directory contains the names and extensions assigned to all telephones on the system.

Integrated Services Digital Network — Basic Rate Interface (ISDN-BRI)

Enables connection of the system to equipment or endpoints that support an Integrated Services Digital Network (ISDN) by using a standard format called the Basic Rate Interface (BRI). This feature is a 192-Kbps interface that carries two 64-Kbps B-channels and one 16-Kbps D-channel.

ISDN is a global access standard that uses a layered protocol. It eliminates the need for multiple, separate access arrangements for voice, data, facsimile, and video services and networks. Using the same pair of wires that now carry simple telephone calls, ISDN can deliver voice, data, and video services in a digital format.

The ISDN-BRI Trunk circuit pack allows DEFINITY to support the T interface and the S/T interface as defined by ISDN standards (ITU-T recommendation I.411). The circuit pack provides eight ports to the network and supports two B channels and one D channel. ISDN-BRI Trunk provides the following advantages:

- Provides an inexpensive way to connect to ISDN services provided by the network provider.
- Meets almost all ETSI Country protocol requirements.
- Supports essential (not supplementary) ISDN services.

Intercept Treatment

Provides an intercept tone or a recorded announcement or routes the call to an attendant for assistance when calls cannot be completed or when use of a feature is denied.

Intercom — Automatic

Allows two users to talk together easily. Calling users press the Automatic Intercom button and lift the handset. The called user receives a unique intercom ring and the intercom lamp, if provided, flashes. With this feature, users who frequently call each other can do so by pressing one button instead of dialing an extension number.

Intercom — Dial

Allows multi-appearance telephone users to easily call others within an administered group. The calling user lifts the handset, presses the Dial Intercom button, and dials the one- or two-digit code assigned to the desired party. The called user's phone rings, and intercom lamp, if provided, flashes. With this feature, a group of users who frequently call each other can do so by pressing one button and dialing a one- or two- digit code instead of dialing an extension number.

Internal Automatic Answer

Allows specific telephones to answer incoming internal calls automatically. This feature is intended for use with telephones that have speakerphones or headsets. You simply press an Internal Automatic Answer feature button, and calls are automatically answered when the telephone is idle. Internal and Distributed Communications System calls can be answered using automatic answer, but only attendants can use automatic answer to answer external calls directed to the attendant.

Last Number Dialed

Allows you to automatically redial the last number dialed. The system saves the first 24 digits of the last number dialed, whether the call attempt was manually dialed or dialed using Abbreviated Dialing. When you press the Last Number Dialed button or dial the Last Number dialed feature access code, the system places the call again.

Leave Word Calling

Allows internal system users to leave a short preprogammed message (usually "Call" with the calling user's name, extension number, and the time of the call) for other internal users. When the message is stored on the DEFINITY ECS, the Message lamp on the called telephone automatically lights. Leave Word Calling messages can be retrieved using a telephone display, Voice Message Retrieval, or AUDIX. Messages may be retrieved in English, French, Italian, Spanish, or a user-defined language.

Line Lockout

Removes single-line telephone extension numbers from service when users fail to hang up after receiving dial tone for 10 seconds (default) and then an intercept tone for 30 seconds (default). These intervals are administrable. The out-of-service condition lasts until the telephone user hangs up the phone.

Listed Directory Number

Allows outside callers to access your attendant group in two ways, depending on the type of trunk used for the incoming call. You can allow attendant group access via incoming direct inward dial trunks, or you can allow attendant group access via incoming central office) and foreign exchange trunks.

Loudspeaker Paging Access

Provides attendants and telephone users dial access to voice paging equipment. As many as nine paging zones can be provided by the system and one zone can be provided that activates all zones at the same time. (A zone is the location of the loudspeakers — for example, conference rooms, warehouses, or storerooms.) A user can activate this feature by dialing the trunk access code of the desired paging zone, or the access codes can be entered into Abbreviated Dialing Lists. Once you have activated this feature, you can simply speak into the handset to make the announcement.

Deluxe Loudspeaker Paging Access (called Deluxe Paging) provides attendants and telephone users with integrated access to voice-paging equipment and Call Park capabilities. When you activate Deluxe Paging, the call is automatically parked. The parked call returns to the parking user with distinctive alerting when the time-out interval expires.

Manual Message Waiting

Allows multi-appearance telephone users to light the status lamp associated with the manual Message Waiting button at another multi-appearance telephone. They do this by simply pressing a button on their own telephone. This feature can be administered only to pairs of telephones such as a secretary and an executive. The secretary might press the button to signal to the executive that a call needs answering or someone has arrived for an appointment. The executive might use the button to indicate that he or she should not be disturbed.

Manual Originating Line Service

Connects single-line telephone users to the attendant automatically when the user lifts the handset. The attendant number is stored in an Abbreviated Dialing list. When the telephone user lifts the handset, the system automatically routes the call to the attendant using the Hot Line Service feature.

Manual signaling

Allows one user to signal another user. The receiving user hears a two-second ring. The signal is sent each time the button is pressed by the signaling user. The meaning of the signal is prearranged between the sender and the receiver. Manual Signaling is denied if the receiving telephone is already ringing from an incoming call.

Misoperation Handling

Defines how calls are handled when a misoperation occurs. A misoperation is when calls are left on hold when the controlling station goes on hook.

For example, a misoperation can occur under either of the following conditions:

- If you hang up prior to completing a feature operation (in some cases, hanging up completes the operation, as in call transfer). If, for example, you place a call on hold, begin to transfer the call, dial an invalid extension number, and then hang up, that's a misoperation.
- When the system enters night service while attendant consoles have calls on hold.

The system administrator can alter the standard Misoperation Handling to ensure that an external caller is not left on hold indefinitely, or dropped by the system after a misoperation with no way to reach someone for help.

This feature is used only in France and Italy.

Modem Pooling

Enables switched connections between digital data endpoints (data modules) and analog data endpoints and acoustic coupled modems. Data transmission between a digital data endpoint and an analog endpoint requires a conversion since the DCP format used by the data module is not compatible with the modulated signals of an analog modem. A modem translates DCP format into modulated signals and vice versa. The Modem Pooling feature provides a set of modems for such conversions.

Multi-Appearance Preselection and Preference

Provides options for placing or answering calls on selected call appearances. Ringing Appearance *Preference* automatically connects you to the incoming ringing call when the user picks up the handset. *Idle Appearance Preference* automatically connects you to an idle appearance. *Preselection* allows the user to manually select an appearance. Preselection is used, for example, when you want to reconnect with a held call or activate a feature. Preselection can be used with a feature button. For example, if you press an Abbreviated Dialing button,

the call appearance is automatically selected and, if you pick up the handset within five seconds, the call is automatically placed. The Preselection option overrides both of the other preference options.

Music-on-Hold Access

Automatically provides music, silence, or tone to a caller. Music lets the caller know that the connection is still valid. Many different music options can be administered to accommodate different tenants on the DEFINITY ECS. See the Tenant Partitioning feature for more information.

Night Service

There are five Night Service features:

- Hunt Group Night Service allows an attendant or a split supervisor to assign a hunt group or split to Night Service mode. All calls for the hunt group then are redirected to the hunt group's designated Night Service extension. When a user activates Hunt Group Night Service, the associated button lamp lights.
- Night Console Service directs all calls for primary and daytime attendant consoles to a night console. When a user activates Night Console Service, the Night Service button for each attendant lights and all attendant-seeking calls (and calls waiting) in the queue are directed to the night console. To activate and deactivate this feature, the attendant typically presses the Night button on the principal attendant console or designated console.
- Night Station Service directs incoming calls for the attendant to designated extensions. Attendants can activate Night Station Service by pressing the Night button on the principle console if there is not an active night console. If the night station is busy, calls (including emergency attendant calls) receive a busy tone. They do not queue for the attendant.
- Trunk Answer from Any Station allows telephone users to answer all incoming calls to the attendant when the attendant is not on duty and when other voice terminals have not been designated to answer the calls. The incoming call activates a gong, bell, or chime and a voice-terminal user dials an access code to answer the call.
- Trunk Group Night Service allows an attendant or a designated telephone user to individually assign a trunk group or all trunk groups to the night service mode. Specific trunk groups individually assigned to the service are in Individual Trunk Night Service Mode. Calls coming into these trunk groups are redirected to designated night service extensions. Incoming calls on other trunk groups are processed normally.

PC/PBX Connection

PC/PBX Connection provides an integrated-voice and data-workstation interface from DEFINITY ECS to a 6300 or other compatible personal computer. The connection provides access to a variety of host computers, allowing the personal computer to act as a terminal for the host.

Personal Station Access

Allows you to transfer your telephone station preferences and permissions to any other compatible telephone. This includes the definition of terminal buttons, abbreviated dial lists, and Class of Service and Class of Restrictions permissions. It can be used on-site or off-site (with DEFINITY Extender). This has several telecommuting applications. For example, several telecommuting employees can share the same office on different days of the week. The employees can easily and remotely make the shared telephone “theirs” for the day. Remote use requires DEFINITY Extender.

Personalized Ringing

Allows users of certain telephones to uniquely identify their own calls. Each user can choose one of a number of possible ringing patterns. The eight ringing patterns are tone sequences consisting of different combinations of three tones. With this feature, users working closely in the same area can each specify a different ringing pattern in order to better identify their own calls.

Power Failure Transfer

Provides service to and from the local telephone company central office, including Wide Area Telecommunications System, during a power failure. This allows you to make or answer important or emergency calls during a power failure. This feature is also called Emergency Transfer.

Priority Calling

Allows you to ring another telephone with a distinctive signal that tells the called party the incoming call requires immediate attention. The called party can then handle the call accordingly. You activate priority calling by Dialing a Priority Calling access code or pressing a feature button, followed by the extension number. You can use Priority Calling only if your telephone has been administered with the required class of service.

Privacy — Attendant Lockout

Prevents an attendant from reentering a multiple-party connection held on the console unless recalled by a telephone user. This feature is administered on a system-wide basis. It is either activated or not activated.

Privacy — Manual Exclusion

Allows multi-appearance telephone users to keep other users with appearances of the same extension number from bridging onto an existing call. Exclusion is activated by pressing the Exclusion button on a per-call basis.

Public Network Call Priority

Public Network Call Priority provides call retention, forced disconnect, intrusion, mode-of-release control, and rering to switches on public networks. Different countries frequently refer to these capabilities by different names.

Pull Transfer

Allows *either* the party who was originally called *or* the party to whom the held call will be transferred to complete the transfer. This is a convenient way to connect a party with someone better qualified to handle the call. Attendant assistance is not required and the call does not have to be redialed. It interfaces with satellite workstations via TGU/TGE trunks and is always available for calls that use TGU/TGE trunks.

Recall signaling

Recall Signaling allows the user of an analog station to place a call on hold, use the voice terminal for other call purposes, and then return to the original call.

Recorded Announcements

Provides an announcement to callers under a variety of circumstances. For example, announcements let callers know that their call cannot be completed as dialed, that their call is in queue, or that all lines are busy.

Recent Change History

Allows the system manager to view or print a history report of the most recent administration and maintenance changes on the switch. This report may be used for diagnostic or information purposes.

Recorded Announcement

Provides a recorded announcement to a variety of types of calls: calls that cannot be completed as dialed, calls that have been in queue for an assigned interval, any calls whose destination is an announcement, or incoming calls to a user.

Recorded Telephone Dictation Access

Allows telephone users, including Remote Access and incoming tie trunk users, to access dictation equipment. The dictation equipment is accessed by dialing an access code or extension number. The start/stop function can be voice or dial controlled. Other functions such as initial activation and playback are controlled by additional dial codes.

Remote Access

Permits authorized callers from remote locations to access the system via the public network and then use its features and services.There are a variety of ways of accessing the feature. After gaining access, you hear a system dial tone, and, for system security, may be required to dial a barrier code.

Restriction — Controlled

Allows an attendant or telephone user with console permission to activate and deactivate for an individual telephone or a group of telephones the following restrictions: outward, total, station-to-station, and termination restrictions.

Ringback Queuing

Places calls in an ordered queue (first in, first out) when all trunks are busy. The telephone user who is trying to make a call is automatically called back when a trunk becomes available, and hears a distinctive three-burst signal when called back.

Ringer Cutoff

Allows the user of a multi-appearance telephone to turn audible ringing signals on and off. Visual alerting is not affected by this feature. When this feature is enabled, only Priority (three-burst) ring, Redirect Notification, Intercom ring, and manual signaling ring at the telephone. Internal and external calls do not ring.

Ringing — Abbreviated and Delayed

Allows you to manually or automatically assign one of four ring types to each call appearance on a telephone. Whatever treatment you assign to a call appearance is automatically assigned to each of its bridged call appearances.

Security Violation Notification

Security Violation Notification (SVN) allows you to set security-related parameters and to receive notification when the limits that you have established are violated. You can run reports related to both valid and invalid access attempts. You can also disable a login ID or remote access authorization that is associated with a security violation.

Send All Calls

Allows users to temporarily direct all incoming calls to coverage regardless of the assigned call-coverage redirection criteria. Covering users can temporarily remove their voice terminals from the coverage path. The feature is activated and deactivated via a button or access code.

Station Hunting

Routes calls made to a busy extension to another extension. To use Station Hunting, you create a station hunting chain that governs the order in which a call routes from one extension to the next when the called extension is busy. Each extension in the chain links *to* only one subsequent extension. An extension may be linked *from* any number of extensions, however.

Station Security Codes

To provide additional security around the customer options the “init” login has been provided with additional security for the purpose of establishing an authentication procedure for attempts to remotely log into the system.

Telephone Self Administration

Allows you to program feature buttons on 6400-series telephones yourself.

Temporary Bridged Appearance

Allows multiappearance telephone users in a terminating extension group or personal central office line group to bridge onto an existing group call. If a call has been answered using the Call Pickup feature, the originally called party can bridge onto the call. This feature also allows a called party to bridge onto a call that redirects to coverage before the called party can answer it.

Tenant Partitioning

Allows partitioning of the system in order to lease the system's services and features to tenants. This provides attractive new services and revenue for "virtual" landlords. It provides the robust features of a large system at affordable rates to small business tenants. The system supports up to 100 partitions and 27 Attendant Groups. Multiple Attendant Groups can be assigned to each partition. Stations, hunt groups, and other endpoints assigned to a Class of Service can be partitioned. Network routing pattern preferences also support the assigned tenant partitioning. Tenant Partitioning also allows you to assign a unique music source for each tenant partition for customers who are put on hold.

Terminal Translation Initialization

Allows you to merge an Administration Without Hardware station to a valid port from a terminal connected to that port. You simply dial a system-wide security code and the extension. This feature also allows you to separate a station from its port by dialing a similar separate digit sequence. This action causes the station to be administered without hardware.

Terminating Extension Group

Allows an incoming call to ring (either audible or silent alerting) as many as four telephones an one time. Any user in the group can answer the call. Any telephone can be administered as a group member. Only a multi-appearance telephone can be assigned a feature button with an associated status lamp, however. The feature button allows the user to select a Terminating Extension Group call appearance for answering or bridging onto an existing call but not for call origination. For example, a department in a large store might have three telephones. Anyone in the department can answer the call. The salesperson most qualified to answer the call can bridge onto the call.

Timed Reminder and Attendant Timers

Automatically alerts the attendant after an administered time interval for the following types of calls: extended calls to be answered or waiting to be connected to a busy single-line telephone, one-party calls placed on hold on the console, and transferred calls that have not been answered after transfer. Timed Reminder informs the attendant that a call requires additional attention. After the attendant reconnects to the call, the user can either choose to try another extension number, hang up, or continue to wait. DEFINITY ECS supports a variety of administrable attendant timers for use in a variety of situations.

Transfer

Allows telephone users to transfer trunk or internal calls to other telephones within the system without attendant assistance. This feature provides a convenient way to connect a party with someone better qualified to handle the call. Single-line telephone users momentarily flash the switchhook or press the Recall button, dial the desired extension, and hang up. Multiappearance telephone users press the Transfer button, dial the desired extension number, and press the Transfer button again.

Transfer — Outgoing Trunk to Outgoing Trunk

Allows a user or attendant to initiate two or more outgoing trunk calls and then transfer the trunks together. The transfer operation removes the original user from the connection and conferences the outgoing trunks. Alternatively, the controlling party can establish a conference call with the outgoing trunks and then drop out of the conference, leaving only the outgoing trunks on the conference. This is an optional enhancement to Trunk-to-Trunk Transfer and requires careful administration and use. DCS Trunk Turnaround may be a safer alternative to this feature.

Trunk Flash

Trunk Flash allows a feature or function button on a multifunction telephone or attendant console to be assigned as a Flash button. Pressing this button while connected to a trunk (which must have been administered to allow trunk flash) causes the system to send a flash signal out over the connected trunk.

Trunk Flash enables multifunction voice terminals to access central office customized services that are provided by the Central Office to which DEFINITY ECS is connected. These services are electronic features, such as conference and transfer, that are accessed by a sequence of flash signal and dial signals from the DEFINITY System station on an active trunk call. The Trunk Flash feature can help to reduce the number of trunk lines connected to the DEFINITY system. “Digit 1 as Flash” as used in Italy and the United Kingdom will not serve as the flash button in this application.

Trunk Group Busy/Warning Indicators to Attendant

Provides the attendant with a visual indication that the number of busy trunks in a group has reached an administered level. A visual indication is also provided when all trunks in a group are busy. This feature is particularly helpful to show the attendant that the Attendant Control of Trunk Group Access feature needs to be invoked.

Trunk Identification By Attendant

Allows an attendant or display-equipped telephone user to identify a specific trunk being used on a call. This capability is provided by assigning a Trunk ID button to the attendant console or telephone. This feature is particularly helpful for identifying a faulty trunk. That trunk can then be removed from service and the problem quickly corrected.

Trunk-to-Trunk Transfer

Allows the attendant or telephone user to connect an incoming trunk call to an outgoing trunk call. This feature is particularly useful when a caller outside the system calls a user or attendant and requests a transfer to another outside number. For example, a worker, away on business, can call in and have the call transferred elsewhere. The system assures that incoming central office trunks without Disconnect Supervision are not transferred to outgoing trunks or other incoming central office trunks without Disconnect Supervision.

Visually Impaired Attendant Service

Provides voice feedback to a visually impaired attendant in either Italian or British English. Each voice phrase is a sequence of one or more single voiced messages. This feature defines six new attendant buttons to aid visually impaired attendants:

- Visually Impaired Service Activation/Deactivation button: activates or deactivates the feature. All ringers previously disabled (for example, recall and incoming calls) become reenabled.
- Console Status button: voices whether the console is in Position Available or Position Busy state, whether the console is a night console, the status of the attendant queue, and the status of system alarms.
- Display Status button: voices what is shown on the console display. VIAS support is not available for all display features (for example, class-of-restriction information, personal names, and some call purposes).
- Last Operation button: voices the last operation performed.
- Last Voiced Message button: repeats the last voiced message.
- Direct Trunk Group Selection Status button: voices the status of an attendant-monitored trunk group.

The visually impaired attendant may use the Inspect mode to locate each button and determine the feature assigned to each without actually executing the feature.

Voice Message Retrieval

Allows telephone users, remote access users, and attendants to retrieve Leave Word Calling and Call Coverage voice messages. It can be used to retrieve a user's own messages or messages for another user. However, a different user's messages can be retrieved only by a user at a telephone or attendant console in the coverage path, by an administered system-wide message retriever, or by a remote-access user when the extension and associated security code are known. The system restricts unauthorized users from retrieving messages.

Voice Terminal Alerting Options

Provides multi-appearance telephone users with different ringing patterns. This feature primarily affects audible ringing for calls directed to telephones that are off hook, or calls directed to idle and active CALLMASTER telephones.

Voice Terminal Display

Provides multi-appearance telephone users with updated call and message information. This information is displayed on a display-equipped telephone. The information displayed depends upon the display mode selected by the user. Information that allows personalized call answering is available on many calls.

Users may select any of the following as the display message language: English (default), French, Italian, or Spanish. In addition, messages can be administered on the system in a fifth language. The language for display messages is selected by each user.

Whisper Page

Allows an assistant or colleague to bridge onto your telephone conversation and give you a message without being heard by the other party or parties you are talking to.

World Class Tone Detection

Enables the DEFINITY ECS to identify and handle different types of call progress tones, depending on the system administration. You can use the tone detector and identification to display on Data Terminal Dialing and to decide when to send digits on trunk calls through Abbreviated Dialing, ARS, AAR, and Data Terminal Dialing.

"Tone detect mode 1" designates countries that use the same tone plan as Italy. "Tone detect mode 2" designates countries that use the same tone plan as Australia. "Tone detect mode 3" designates countries that use the same tone plan as the United Kingdom. "Tone detect mode 4" designates countries that use dial tones between 345 Hz and 625 Ha. "Tone detect mode 5" designates countries that use dialtones between 345 Hz and 1190 Hz. The "level of tone

detection precise" is used in countries that, except for the continuous dial tone and discontinuous other tone, have tones with characteristics that do not match those expected by the tone detector board's detect mode. The "level of tone detection broadband" is used in countries that have a discontinuous dial tone.

World Class Tone Generation

Allows you to define call-progress tones. You can select values for frequency and cadence. If you do not define a call-progress tone, DEFINITY ECS sends silence.

Call Center Features

DEFINITY ECS offers the following features designed to help you set up and maintain a modern call center.

Abandoned Call Search

Allows a central office that does not provide timely disconnect supervision to identify abandoned calls. An abandoned call is one in which the calling party hangs up before the call is answered. Abandoned Call Search is suitable only for older central offices that do not provide timely disconnect supervision.

Add/Remove Skills

Allows an agent using Expert Agent Selection to add or remove skills. A skill is a numeric identifier that refers to an agent's specific ability. For example, an agent who speaks English and Spanish could be assigned a language -speaking skill with an identifier of 20. The agent then adds skill 20 to his or her set of working skills. If a customer needs a Spanish-speaking agent, the system routes the call to an agent with that skill. Each agent can have up to four active skills, and each skill is assigned a priority level.

Agent Call Handling

Allows you to administer functions that Automatic Call Distribution agents use when handling incoming calls. You define specific agent capabilities and can plan capacities based on those capabilities. The same list of agent capabilities are also supported through the CallVisor Adjunct/Switch Applications Interface (ASAI).

Auto-Available Split

Allows members of an ACD split to be in Auto-In work mode continuously. An agent in Auto-In work mode becomes available for another ACD call immediately after disconnecting from an ACD call. You can use AAS to bring ACD-split mem-

bers back into Auto-In work mode after a system restart. Although not restricted to such, this feature is intended to be used for splits containing only recorders or voice-response units.

Automatic Call Distribution

Allows incoming calls to connect automatically to specific splits. An ACD split is a hunt group designed to receive a high volume of similar calls. Calls to a specific split are automatically distributed among the agents, or hunt group members, assigned to that split.Calls queue to the split until an agent is available. You can assign a supervisor to each split. The split supervisor can listen in on agent calls, monitor the split queue status, and assist agents. If you have Call Management System or Basic Call Management System, you can measure and create reports on the status of ACD agents, splits, and trunks.

Basic Call Management System

Basic Call Management System provides real-time and historical reports to assist you in managing agents, ACD splits (hunt groups), VDNs, and trunk groups. You can display reports on the Management Terminal or print them. In addition, you can schedule historical reports to print automatically on the system printer.

Call Management System (CMS)

Allows you to collect and monitor ACD facilities and personnel. You can create reports on the status of agents, splits, trunks, vectors, and vector directory numbers. You can store historical CMS reports or display real-time reports at a terminal. Unlike Basic Call Management System, the CMS resides on an adjunct computer that connects to the system via a data link.

Call Prompting

Allows the system to collect information from the calling party and direct the calls via Call Vectoring. The caller is verbally prompted by the system and enters information in response to the prompts. This information is then used to redirect the call or handle the call in some other way (taking a message, for example). This feature is mostly used to enhance the efficient handling of calls in the Automatic Call Distribution application.

Call Vectoring

Processes incoming and internal calls according to a programmed set of commands. Vector commands may direct calls to on-premise or off- premise destinations, to any hunt group or split, or to a specific call treatment such as an announcement, forced disconnect, forced busy, or delay treatment. For example, the system can collect digits from the user via Call Prompting and route calls to a

destination specified by those digits. There are many different applications of the Call Vectoring feature, however, Call Vectoring is primarily used to handle the call activity of Automatic Call Distribution splits and skills.

Calling Party/Billing Number

Allows the system to transmit Calling Party Number/Billing Number (CPN/BN) information to an ISDN-PRI trunk group. The CPN is the calling party's telephone number. BN is the calling party's billing number. The CPN/BN may contain international country codes. It is used with an adjunct application.

Calling/Connected Party Number (CPN) Restriction

Per Line CPN Restriction

Users may block the Calling Party Number when originating calls. For ISDN calls, the CPN Presentation Indicator is encoded accordingly. For non-ISDN calls, going to a public network that supports the CPN Restriction feature, the network specific Feature Activation Code gets passed to the network for interpretation and activation.

If Per Line CPN Restriction is administered for a station, it will override any ISDN Trunk Group administration for sending Calling Party Number.

Per Call CPN Restriction

Users may indicate Calling Number privacy information. For ISDN calls, the CPN Presentation Indicator is encoded accordingly. For non-ISDN calls going to a public network that supports the CPN Restriction feature, the network specific Feature Activation Code gets passed to the network for interpretation and activation of the desired feature.

If Per Call CPN Restriction is activated for an outgoing call, it will override any Per Line CPN Restriction administration for the calling station, and will override any ISDN Trunk Group administration for sending Calling Number.

CallVisor Adjunct-Switch Application Interface (ASAI)

Links DEFINITY ECS and adjunct applications. The interface allows adjunct applications to access DEFINITY ECS features and supply routing information to the system. CallVisor ASAI improves ACD agents' call handling efficiency by allowing an adjunct to monitor, initiate, control, and terminate calls on the switch. The CallVisor ASAI interface may be used for Inbound Call Management, Outbound Call Management, and office automation/messaging applications. It uses two transport types: ISDN-BRI transport (CallVisor ASAI-BRI) and LAN Gateway

Transmission Control Protocol/Internet Protocol transport (DEFINITY LAN Gateway). CallVisor ASAI messages and procedures are based on the ITU-T Q.932 international standard for supplementary services.

Direct Agent Announcement

Direct Agent Announcement (DAA) enhances Direct Agent Calling capabilities for CallVisor Adjunct-Switch Application Interface (ASAI) and Expert Agent Selection (EAS). It plays an announcement to Direct Agent callers waiting in a queue.

Expert Agent Selection

Enables certain Expert Agent Selection skill types to be assigned to a call type or a Vector Directory Number. Routing calls via vectoring then allows the system administration to direct calls to agents who have the particular agent skills required to complete the customers' inquiries successfully.

Flexible Billing

Allows DEFINITY ECS or an adjunct to communicate with the public network using ISDN PRI messages to change the billing rate for an incoming 900-type call. Rate-change requests to specify a new billing rate can be made anytime after a call is answered and before it disconnects.

Flexible Billing is available in the U.S. for use with AT&T MultiQuest® 900 Vari-A-Bill™ Service. Flexible billing requires a CallVisor Adjunct-Switch Application Interface and other application software.

Inbound Call Management

Allows you to integrate DEFINITY features with host-application processing and routing, and automate delivery of caller information to agents' displays. You can create a sophisticated system to handle inbound calls for applications such as telemarketing and claims processing.

In addition, you can automate ACD agent terminal displays and associate them with new and transferred calls, and assist calls to a supervisor. You can display incoming call information such as Calling Party Number, Billing Number, and Dialed Number Identification Service. Or, you can set up the adjunct to retrieve caller information from a database and display it on a particular agent's screen, based on the service dialed.

Intraflow and Interflow

Intraflow and Interflow allow you to redirect ACD calls from one split to another split. Intraflow redirects calls to other splits within the system using Call Coverage or Call Forwarding All Calls. Interflow redirects calls to an external split or location using Call Forwarding All Calls. You can have calls redirected from one split to another *conditionally*, according to the coverage path's redirection criteria. For example, you can define a split's coverage path to automatically redirect incoming ACD calls to another split when a terminal is busy or unanswered.

Look-Ahead Interflow

Balances the load of ACD calls across multiple locations. With Look-Ahead Interflow, you can optionally route a call to a backup location based on your system's ability to handle the call within parameters defined in a vector. In turn, the backup system can accept or deny the call also based on defined parameters.

Malicious Call Trace

Allows you to trace malicious calls. You define a group of terminal users who can notify others in the group when they receive a malicious call. These users can then retrieve information related to the call. Using this information, you can identify the malicious call source or provide information to personnel at an adjacent system to complete the trace. It also allows you to record the malicious call.

Multiple Call Handling

Allows agents to receive an ACD call while other types of calls are alerting, active, or on hold.

Queue Status Indications

Allows you to assign queue-status indicators for Automatic Call Distribution calls based on the number of calls queued and time in queue. You can assign these indications to lamps on agent, supervisor, or attendant terminals or consoles to help monitor queue activity. In addition, you can define auxiliary queue warning lamps to track queue status. On display telephones, you can display the number of calls queued and time in queue of a split's oldest call.

Reason Codes

Allows agents to enter a numeric code that describes their reason for entering Auxiliary (AUX) work mode or for logging out of the system. Reason codes give call center managers detailed information about how agents spend their time. You can use this data to develop more precise staffing forecasting models or use

it with schedule-adherence packages to ensure that agents are performing scheduled activities at the scheduled time. You must have Expert Agent Selection (EAS) enabled to use reason codes.

Redirection on No Answer

Redirects a ringing ACD split or skill call or Direct Agent Call after an administered number of rings. This prevents an unanswered call from ringing indefinitely. The call can redirect either to the split or skill to be answered by another agent or to a vector directory number (VDN) for alternative call handling. Direct Agent Calls route to the agent's coverage path, or to a VDN if no coverage path is administered. You must have ACD enabled to use this feature.

Service Observing

Allows a specified user, such as a supervisor, to observe or monitor another user's calls. A vector directory number call can also be observed. Observers can observe in listen-only or listen-and-talk mode. You set up Service Observing to observe a particular extension, not all calls to all extensions at a terminal.

NOTE:
Service Observing may be subject to federal, state, or local laws, rules, or regulations or require the consent of one or both of the call parties. Familiarize yourself and comply with all applicable laws, rules, and regulations before using this feature.

VDN in a Coverage Path

VDN in a Coverage Path enhances Call Coverage and Call Vectoring to allow you to assign vector directory numbers (VDNs) as the last point in coverage paths. Calls that go to coverage can be processed by vectoring/prompting to extend Call Coverage treatments.

VDN of Origin Announcement

VDN of Origin Announcement provides agents with a short message about a caller's city of origin or requested service based on the VDN used to process the call. VOA messages help agents respond appropriately to callers. For example, if you have two 800 numbers, one for placing orders and one for technical support, you can administer two VDNs to route calls to the same set of agents. When an incoming call is routed to a VDN with a VOA assigned (for example, "new order" or "tech help"), the VDN routes the call to a vector, which can place the call in an agent queue. When an agent answers the call, he or she hears the VOA message and can respond appropriately to the caller's request.

Voice Response Integration

Integrates Call Vectoring with the capabilities of voice response units such as the Lucent Technologies CONVERSANT Voice Information System. You can also integrate a voice response unit with ACD. All this provides a variety of advantages. For example, while a call is queued, a caller can listen to product information via an audiotext application or can complete an interactive voice-response transaction. It may be possible to resolve the caller's questions while the call is queued, which helps reduce queuing time for other callers during peak times.

VuStats

VuStats presents Basic Call Management System (BCMS) statistics on telephone displays. Agents, supervisors, call center managers, and other users can press a button and view statistics for agents, splits or skills, VDNs, and trunk groups. These statistics can help agents monitor their own performance or respond appropriately to the caller's request.

Hospitality Features

The following features are designed for use in the hospitality industry. Other features listed elsewhere may be of use in this industry, however. The Attendant Crisis Alert feature, for example, described in the Basic Features section of this appendix, is primarily used in lodging establishments. That feature is listed as a basic feature because it is available on any system that has the appropriate attendant console.

Attendant Room Status

Allows an attendant to see whether a room is vacant or occupied and what the housekeeping status of each room is. This feature is only available when you have Enhanced Hospitality enabled for your system. This feature combines the property management capabilities of Check-In/Check-Out and Housekeeping Status but does not require that you have a Property Management System.

Automatic Wakeup

Allows attendants, front desk users, and guests to request that a wakeup call be placed automatically to a certain extension number at a later time. When a wakeup call is placed and answered, the system can provide a recorded announcement (which can be a speech synthesis announcement), music, or simply silence. With the Integrated Announcement feature, multiple announcements enables international guests to use wakeup announcements in a variety of languages.

Do Not Disturb

Allows guests, attendants, and authorized front desk users to request that no calls, other than priority calls, be connected to a particular extension until a specified time.

Dual Wakeup

This capability is part of the Automatic Wakeup Hospitality Hotel/Motel feature. Dual Wakeup allows each extension to request two wakeup calls within one 24-hour period.

Room Activated Wakeup With Tones

This capability is part of the Automatic Wakeup Hospitality Hotel/Motel feature. Room Activated Wakeup With Tones allows guests to schedule wakeup calls via tones that prompt for the time they want to receive the wakeup call.

Hospitality Services

A system with Hospitality enabled and Hospitality Parameter Reduction disabled provides all system capabilities and supports all types of customers. A system with both Hospitality and Hospitality Parameter Reduction enabled provides reduced system parameters that have a major impact on essential system features used by nonlodging customers. The Hospitality features set (Auto Wakeup, Do Not Disturb, Property Management System) is the same on both packages.

Names Registration

Automatically sends a guest's name and room extension from the Property Management System to the system at check-in, and automatically removes this information at check-out. The information may be displayed on any attendant console or display-equipped telephone at various hotel locations (for example, Room Service, or Security).

Property Management System Interface

Provides a communications link between the system and a Property Management System. The Property Management System allows a customer to control features used in both a hospital-type and a hotel/motel-type environment. The communications link allows the Property Management System to interrogate the system and allows information to be passed between the system and the Property Management System.

Property Management System (PMS) Digit to Insert/Delete

Many customer configurations base the room telephone extension on the room number by adding an extra leading digit. The PMS Insert/Delete Digit feature allows users to delete the leading digit of the extension in messages. The feature is useful for a hotel that has multiple extensions sharing an extra leading digit in front of the room number. The leading digit is automatically inserted when the message goes to the PBX.

NOTE:
The PMS interface supports 3-, 4-, or 5-digit extensions, but prefixed extensions do not send the entire number across the interface. Only the assigned extension number is sent. Therefore, you should not use prefixed extensions for numbers that are also going to use the Digit to Insert/Delete function.

Single-Digit Dialing and Mixed Station Numbering

Allows hotel staff and guests easy access to internal hotel/motel services and provides the capability to associate room numbers with guest room telephones. The feature provides the following dial plan types: single-digit dialing, prefixed extensions, and mixed numbering.

Multimedia Features

DEFINITY ECS inherently handles high-volume multimedia transmissions efficiently and will continue to add multimedia features to improve on its multimedia capabilities.

Multimedia calls are initiated with voice and video only. Once a call is established, one of the parties may initiate an associated data conference to include all of the parties on the call who are capable of supporting data. The data conference is controlled by an adjunct device called an Expansion Services Module (ESM).

Multimedia call Early Answer on vectors and stations

Early Answer is a feature applied to multimedia calls in conjunction with conversion to voice. Early Answer:

- Answers the data call
- Establishes the multimedia protocol prior to completion of a converted call
- Ensures that a voice path to/from the originator is available when the (voice) call is answered

For an incoming call, Early Answer answers the dynamic service-link calls when the destination endpoint answers, unless Early Answer is specified during routing or termination processing.

NOTE:
The "destination voice endpoint" might be an outgoing voice trunk if the destination voice station is forwarded or covered off-premises.

Multimedia Call Handling

Multimedia Call Handling allows you to administer a telephone and a multimedia endpoint as a multimedia complex. Through this multimedia complex, users can place voice or video calls using a single number. They can conduct video conferences, and they can forward, cover, hold, or park multimedia calls much as they would standard voice calls.

The multimedia complex handles calls that conform to the H.320 suite of protocol standards. These standards allow video-conferencing systems from different vendors to communicate. An H.320 call can contain voice, video and data. The capabilities of individual multimedia-endpoint packages may vary.

Multimedia data conferencing (T.120) via ESM

The data conference is controlled by an adjunct device called an Expansion Services Module (ESM). The Expansion Services Module is used to terminate T.120 protocols [including Generalized Conference Call (GCC), a protocol standard for data conference control] and provide data conference control and data distribution. The MultiMedia Interface circuit pack, TN787, is used to rate adapt T.120 data to/from the ESM.

The ESM represents an existing piece of equipment connected to the switch in a new way. The ESM itself is built on a MAP40 PC platform, connected to the DEFINITY switch via a PRI link. The link terminates on a new switch-resident PRI board (TN 2207), which is modified from a standard PRI board with provisions for cable interconnection to a switch-resident TN787 MMI board. The MMI operates in the "ESM mode", and serves to rate-adapt the T.120 data stream from a service link to the full bandwidth of a PRI B-channel. The cable carries the adapted data stream over to the PRI link, which carries the information out to the ESM proper.

The ESM is connected to the switch via an E1/T1 PRI link "front-ended" by an MMI operating in a special ESM interface mode. The ESM MMI provides rate adaption between the data subchannel of each endpoint's H.221 protocol stream and a PRI B-channel to the ESM.

Multimedia multiple-port network

In R6, the expansion to multiple-port networks required a distinction between G3r and G3si. For G3r, R6 supports the equivalent of 580 Basic mode complexes operating at 6CCS traffic level. All enhanced mode complexes operate with soft-mode service links since the use of hard-mode service links reduces capacities. G3si limits are 1/3 to 1/2 of the G3r limits, depending on memory limitations and port network limitations.

Call Detail Recording (CDR)

The service-link architecture provides for conversion between one or more data calls and a multimedia or voice-only call. For calls originating from a data endpoint or trunk, the service-link calls terminate on a meet-me user representing the actual voice or multimedia user to whom the call is routed. For calls originating from a voice or multimedia user, the service link calls are originated from a meet-me user representing the originator. On the multimedia or voice-only side, the data endpoint or trunk is represented by a “multimedia” user.

CDR for Service-Link Calls

Separate CDR records are generated for each data call comprising a service link.

Private Networking Features

The great expandability of DEFINITY ECS makes it a logical choice for setting up private networks. Consequently, the system includes many private networking features.

Centralized Attendant Service

Enables attendant services in a private network to be concentrated at a central location. Each branch in a Centralized Attendant Service has its own listed directory number or other type of access from the public network. Incoming calls to the branch, as well as calls made by users directly to the attendants, are routed to the centralized attendants over release link trunks.

Distributed Communications System

Distributed Communications System (DCS) allows you to configure 2 or more switches as if they were a single, large DEFINITY ECS. DCS provides attendant and voice-terminal features between these switch locations. DCS simplifies dialing procedures and allows transparent use of some of the DEFINITY ECS features. (Feature transparency means that features are available to all users on DCS regardless of the switch location.)

DCS Alphanumeric Display for Terminals

Within a distributed communication system, call information is displayed on users' alphanumeric displays. This feature allows calling-name display, called-name display, and miscellaneous identifiers to be transferred from a telephone on one node to a telephone on another node. This gives the user considerable call handling capabilities when calls are made to and from other distributed communication system nodes.

DCS Attendant Control of Trunk Group Access

Allows an attendant at any node in the distributed communication system to take control of any outgoing trunk group at an adjacent node. This is helpful when an attendant wants to prevent telephone users from calling out on a specific trunk group for any number of reasons, such as reserving a trunk group for incoming calls or for a very important outgoing call.

DCS Attendant Display

Provides attendants with some transparency when displaying call-related information for calls made to or from both local and remote distributed communication system nodes.

DCS Automatic Callback

Allows a user at one node to make an automatic callback call to a user at another node in the DCS.

DCS Automatic Circuit Assurance

Allows a user or attendant at one node to activate or deactivate Automatic Circuit Assurance referral calls for the entire DCS network. This transparency allows the referral calls to originate at a node other than the node that detects the problem.

DCS Busy Verification of Terminals and Trunks

Allows attendants and multi-appearance telephone users to make test calls to telephones and trunk groups that are located at other nodes within the distributed communication system.

DCS Call Coverage

Provides the DCS messaging required for calls to be covered on remote systems when there is a DCS signaling link (BX.25 or ISDN-PRI) for the trunk groups. Calls to an extension on one system are covered by extensions on remote systems that are administered as coverage points.

DCS Call Forwarding

Allows users to forward all calls to a selected extension number within the distributed communication system network or to an external number. If Call Forwarding and DCS Call Forwarding are both active, and if a call is forwarded between extensions on the same node, the Call Forwarding coverage path is used. If the nodes are different, the DCS Call Forwarding coverage path is used.

DCS Call Waiting

DCS Call Waiting allows calls from one node to busy single-line telephones at another node to wait until the called party is available to accept the call. With DCS Call Waiting, a single-line voice terminal user, by knowing a call is waiting, can quickly process calls from locations within the DCS. DCS Call Waiting works the same way as normal Call Waiting.

DCS Distinctive Ringing

Rings or activates alerting on your telephone in such a way that you are aware of the type of incoming call before answering it. This feature operates in a distributed communication system environment the same as it does within a single system.

By default, internal calls are identified by a 1-burst ringing pattern, external calls by a 2-burst ringing pattern, and priority calls by a 3-burst ringing pattern. You can administer these patterns, however.

DCS Leave Word Calling

Enables users to leave preprogrammed “call me” messages at other terminals within the DCS network. Messages can be left by calling, called, or covering users.

DCS Multiappearance Conference/ Transfer

Provides transparency of transferring and conferencing within a distributed communication system network. This feature allows a user to transfer a call within the distributed communication system as he or she would within the system. Conference Calls can be placed and calls can be transferred to users within the distributed communication system by dialing the Uniform Dial Plan extension number.

DCS Over ISDN-PRI D-channel

Enhances DCS by allowing access to the public network for DCS connections between DCS switch nodes. With this feature, DCS features are no longer restricted to private facilities. The ISDN-PRI B-channel is used for voice communications, and the ISDN-PRI D-channel is used to transport DCS control information.

DCS Trunk Group Busy/Warning Indication

Provides attendants with a visual indication that the number of busy trunks in a remote group has reached an administered level. A visual indication is also provided when all trunks in a trunk group are busy.

DCS With Reroute

A sophisticated DCS rerouting capability for optimizing trunks. When you transfer out of your AUDIX voice messaging system, for example, DEFINITY ECS sets up a new path that optimizes system resources. Similar to the rerouting capabilities used with Q-SIG.

Enhanced DCS

Enhanced DCS adds features to the existing DCS capabilities. Additional features include:

- Exchanging information to provide class of restriction (COR) checking between switches in the EDCS network
- Providing call-progress information for the attendant
- Allowing attendant intrusion between a main and a satellite
- Allowing a main PBX to provide DID/CO intercept treatment rather than the satellite PBX

Extended Trunk Access

Used with Uniform Dial Plan, allows DEFINITY ECS to send any unrecognized number (such as an extension not administered locally) to another system for analysis and routing. Such unrecognized numbers can be Facility Access Codes, Trunk Access Codes, or extensions that are not in the Uniform Dial Plan table. Non-Uniform Dial Plan numbers are administered on either the First Digit Table (on the Dial Plan Record form) or the Second Digit Table. They also are not administered on the Extended Trunk Access Call Screening Table. Extended Trunk Access helps you make full use of automatic routing and Uniform Dial Plan.

Extension Number Portability

Gives you the ability to assign any extension to any system in a subnetwork. Stations can be moved across systems while retaining the original extension number, as long as the systems are part of a defined subnetwork. This feature is used in conjunction with Automatic Alternate Routing and Uniform Dial Plan.

Inter-PBX Attendant Calls

Allows attendants for multiple branches to be concentrated at a main location. Incoming trunk calls to the branch, as well as attendant-seeking voice-terminal calls, route over tie trunks to the main location.

Node Number Routing

Allows you to specify the route pattern associated with each node in a private network. It is a required capability for Extension Number Portability and is used in conjunction with Automatic Route Selection, AAR and ARS Partitioning, Private Networking, and Uniform Dial Plan. Uniform Dial Plan extensions can be routed to a specified node using its associated pattern. Node Number Routing allows a Uniform Dial Plan route pattern based on node numbers or on location codes. On the AAR and ARS Digit Analysis Tables, you also can specify a Node Number instead of a Route Pattern.

Private Network Access

Allows calls to other systems in a private network. These calls do not use the public network. They are routed over your dedicated facilities.

QSIG

QSIG provides compliance to the International Organization for Standardization (ISO) ISDN-PRI private-networking specifications. QSIG is defined by ISO as the worldwide standard for private networks.

QSIG is the generic name for a family of signaling protocols. The Q-reference point or interface is the logical point where signaling is passed between 2 peer entities in a private network. QSIG signaling can provide feature transparency in a single-vendor or multi-vendor environment.

QSIG provides call-related supplementary services. These are services that go beyond voice or data connectivity and number transport and display. Examples of supplementary services include Name Identification, Call Forwarding (Diversion), and Call Transfer.

DEFINITY ECS provides 3 levels of QSIG functionality:

- Basic Call Setup — Supports basic call setup and number transport
- Basic Supplementary Services — Supports Name Identification Services, Call Forwarding (Diversion), and Call Transfer
- Supplementary Services with Rerouting — Supports Call Forwarding (Diversion) with Reroute and Call Transfer with Path Replacement

QSIG Call Forwarding (Diversion)

QSIG Call Forwarding (Diversion) is based on the DEFINITY ECS Call Forwarding feature. It extends the feature transparency aspects of Call Forwarding over a QSIG trunk:

- If QSIG Call Forwarding is activated, all calls are diverted immediately.
- If QSIG Call Forwarding with busy/don't answer is activated and a station is busy, a call is diverted immediately.
- If QSIG Call Forwarding with busy/don't answer is activated and a station is idle but the call is not answered, a call is diverted after a specified number of rings.

These features are activated either by dialing a feature access code or by pressing a button. See Call Forwarding for detailed descriptions of how to use these features.

This feature applies to all QSIG Call Forwarding features. A forwarded call can be rerouted in a private network to find a more cost-effective or resource-efficient path.

QSIG Call Forwarding (Diversion) provides additional call information to both the caller and the diverted-to station above what is provided if the call is forwarded over a trunk that is not administered for QSIG Supplementary Service Protocol b.

QSIG Call Offer

This feature, on request from the calling-user (or on that user's behalf), enables a call to:

- Be offered to a busy called-user
- Wait for a busy called-user to accept the call when the necessary resources have become available.

QSIG Call Transfer

QSIG Call Transfer is based on the current DEFINITY ECS Transfer and Trunk-to-Trunk Transfer features. QSIG Transfer signaling occurs as long as one of the calls involves a QSIG trunk between the two switches. QSIG Transfer con-

forms to ISO 13869 for QSIG Call Transfer By Join. This means that the transfer occurs through the system where the transferring user resides and if the transfer involves two trunks, neither is released after the transferring party is dropped from the call.

When you use this feature, you see no difference between QSIG Call Transfer and the standard DEFINITY ECS Transfer or Trunk-to-Trunk Transfer features. QSIG Call Transfer differs from the standard DEFINITY ECS Transfer feature in that additional call information is available for the connected parties after the transfer completes. However, the information is only sent for QSIG trunks. If one call is local to the transferring switch, that user receives the name of the party at the far end.

QSIG Manufacturers Specific Information (MSI)

QSIG handles non-standardized information that is specific to a particular PBX or network. This information is known as Manufacturer Specific Information (MSI). A manufacturer can define manufacturer-specific supplementary services operations after it has:

- Applied to a sponsoring and issuing organization (ECMA in this case) **ECMA**: European Computer Manufacturers Association
- Been assigned an organization identifier. This organization identifier is used as the root of the manufacturer-specific service-operation value.

All MSI operation values should be unique to that manufacturer.

In R6, a new information-transport interface allows applications to hand-off information for transport across QSIG networks via Manufacturer Specific Information. It is highly likely that more than two applications will need to send information at the same time. Therefore, the limit has been increased to 4 for R6.

Manufacturer-specific supplementary services can be created using specific operations encoded with the manufacturer's identifier. For R6, support has been added for non-QSIG applications to transport information across QSIG networks in MSI. Applications now have the same functionality over QSIG networks that they have over non-QSIG networks. An interface provides application-specific processing of the operations received. The default platform treatment is to store the information.

QSIG Name and Number Identification

Allows a switch to send and receive the calling number, calling name, connected number, and connected name. Additional parameters that control the display of the connected name and number are administered on the Feature-Related Sys-

tem-Parameters form. QSIG Name and Number Identification displays up to 15 characters for the calling and connected name and up to 15 digits for the calling and connected number across ISDN-PRI interfaces.

QSIG - Called/Busy Name Display

A QSIG Called Name or Busy Name displays on the calling party's display as soon as the ALERTING or DISCONNECT message has been received, as long as the System Version is set to R6 or later configurations.

QSIG Path Replacement

DEFINITY ECS provides QSIG Additional Network Feature Path Replacement as defined in ISO/IEC 13863 and 13874. With this feature, a call's connections between switches in a private network can be replaced with new connections while the call is active. This feature is invoked when a call is transferred and improvements may be made in costs. For example, after a call is transferred, the two parties on the transferred call can be connected directly and the unnecessary trunks are dropped off the call. The routing administered at the endpoints may allow for a more cost-effective connection.

The best route is selected based on the preference assigned to routes in the Route Pattern form. Class of Restriction is adhered to in routing calls. This feature is not invoked on data calls because there is a period of time when information can be lost.

QSIG Path Retention

Path Retention maintains the signaling connection and permits the caller to invoke supplementary services. The network connection can be retained for more than one supplementary service if Path Retention has been invoked for that service.

Transit Counter

DEFINITY ECS provides QSIG Transit Counter as defined in ISO/IEC 6B032 and 6B033. It prevents indefinite looping, connections giving poor transmission performance, and inefficient use of network resources. This feature is invoked automatically for ISDN-PRI basic calls.

Uniform Dial Plan

Provides a common 4- or 5-digit dial plan that can be shared among a group of switches. Interswitch dialing and intraswitch dialing both require 4- or 5-digit dialing. This feature is used with an electronic tandem network (ETN); main, satellite,

and tributary switches; and Distributed Communications Systems. In addition, it can provide uniform 4- or 5-digit dialing between 2 or more private-switching systems without ETN, main, satellite, and tributary switches, or DCS.

Trunk Group Features

DEFINITY ECS offers an array of features for managing trunk groups efficiently.

DS1 Trunk Service

Bit-oriented signaling that multiplexes 24 channels into a single 1.544-Mbps stream. DS1 can be used for voice or voice-grade data and for data-transmission protocols. E1 trunk service is bit-oriented signaling that multiplexes 32 channels into a single 2.048-Mbps stream. Both DS1 and E1 provide a digital interface for trunk groups.

Digital Multiplexed Interface

Supports two signaling techniques: bit-oriented signaling and message-oriented signaling for direct connection to host computers.

ISDN — General

Gives you access to a variety of public and private network services and facilities. The ISDN standard consists of layers 1, 2, and 3 of the Open System Interconnect (OSI) model. DEFINITY ECS can be connected to an ISDN using standard frame formats: Basic Rate Interface (BRI) and the Primary Rate Interface (PRI).

An ISDN provides end-to-end digital connectivity and uses a high-speed interface which provides service-independent access to switched services. Through internationally accepted standard interfaces, an ISDN provides circuit or packet-switched connectivity within a network and can link to other ISDN supported interfaces to provide national and international digital connectivity.

R6 BRI Trunk Enhancements

Adds support for public-network access outside the U.S. on point-to-midpoint connections, with the restriction that DEFINITY ECS must not be configured in a passive bus arrangement with other BRI endpoints. It will also support the use of ISDN-BRI trunks as inter-PBX tie lines using the QSIG peer protocol.

BRI: Basic Rate Interface. This standard ISDN interface consists of two 64 Kbps B-channels and one 16 Kbps D-channel.
ISDN: Integrated Services Digital Network.

NT Interface on TN556C

Support for the NT (network) side of the T interface has been added in R6 using the TN556C circuit pack, which DEFINITY R5 uses only for voice and data endpoints. This gives R6 full tie trunk capability using BRI trunks. R6 supports leased

BRI connections through the public network, with a TN2185 on each end of the leased connection. R6 will not, however, allow customers to administer both endpoints and trunks on the same TN556C circuit pack.

NT QSIG Peer Protocol

The NT side of the QSIG Peer Protocol has been added.

Full ETSI Functionality

The full set of ETSI public-network and private-network ISDN features is officially supported. This includes Lookahead Interflow, Lookahead Routing, and Usage Allocation (including the R5 enhancements). It also includes all QSIG supplementary services supported through Release 6:

- Name Identification
- Call Diversion (including rerouting)
- Call Transfer
- Path Replacement.

It does not include

- DCS
- Non-Facility Associated Signaling
- D-Channel Backup,
- Wideband Signaling.

Automatic TEI

The user side will support automatic TEI assignment by the network. Both fixed and automatic TEI assignment will be supported on the network side.

TEI: Termination Endpoint Identifier (part of ISDN terminology).

Layer 1 Deactivation

Layer 1 Stable — Tells call processing and maintenance software whether to expect the network to drop Layer 1 when the BRI port is idle. When acting as the TE side, R6 supports the case where the network deactivates Layer 1 when both B-channels of a BRI port are idle. When acting as the NT side, R6 deactivates Layer 1 only when the BRI port is busied out.

Multiple Subscriber Number (MSN) - Limited

The ISDN standard MSN feature lets customers assign multiple extension to a single BRI endpoint. The MSN feature works with BRI endpoints that allow the Channel ID IE to be encoded as “preferred.”

Call-by-Call Service Selection

Enables a single ISDN-PRI trunk group to carry calls to a variety of services, rather than requiring each trunk group to be dedicated to a specific service. It allows you to set up various voice and data services and features for a particular call.

CAMA - E911 Trunk Group

This form administers the Centralized Automatic Message Accounting (CAMA) trunks and provides Caller’s Emergency Service Identification (CESID) information to the local community’s Enhanced 911 system through the local Central Office.

Facility and Non-Facility Associated Signaling

Allows an ISDN-PRI DS1/E1 interface D-channel to carry signaling information for B-channels (voice or data). D-Channel Backup can also be administered to increase system reliability.

Wideband Switching

Provides the ability to dedicate 2 or more ISDN B-channels or DSO endpoints for applications that require large bandwidth. Certain applications, such as video conferencing and high-speed data transmission, require extra bandwidth and it becomes necessary to put several ISDN-PRI narrowband channels into one wideband channel to accommodate the needs of these applications. This feature supports both European and North American standards.

System Capacity Limits

B

Overview

This appendix provides information on the overall characteristics and capacities of the DEFINITY Systems.

Multiple Offer Categories

Beginning with DEFINITY ECS R6.2, the system software is administered upon initialization to specify an Offer Category. Currently there are two categories: A and B. The Offer Categories are administered by Lucent Technologies personnel or authorized distributors depending on the offer that is purchased.

The Offer Category specifies the system capabilities in the following areas:

- Customer options allowed
- System capacities
- Hardware allowed

Table B-1 summarizes the features and the capabilities between A and B.

Table B-1. Offer Category A vs. B

Offer Category	A	B
Customer Options	All	Following Customer Options not allowed: ASAI Proprietary Adjunct Links ASAI Interface CAS Main Coverage Of Calls Redirected Off-net DCS (Basic) DCS Call Coverage DCS with Rerouting Extend Cover/Forward Administration Flexible Billing Hospitality Parameter Reduction Multimedia Application Server Interface (MASI) Multimedia Call Handling (MMCH) PNC Duplication Tenant Partitioning Wideband Switching BCMS/VuStats Login IDs BCMS/VuStats Service Level Expert Agent Selection (EAS) EAS-PHD DTMF Feedback Signals For VRU Call Work Codes Forced ACD Calls Look Ahead Interflow Multiple Call Handling (Forced) PASTE (Display PBX Data on Phone) Reason Codes Service Observing (Remote by FAC) Service Observing (VDNs) Timed ACW Vectoring (G3V4 enhanced) Vectoring (G3V4 advanced Routing) Vectoring (ANI/II-Digit Routing) Vectoring (CINFO) VDN of Origin Announcements VDN Return Destination VuStats VuStats (G3V4 enhanced) Supplementary Services with Rerouting

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Table B-1. Offer Category A vs. B — *Continued*

Offer Category	A	B
Features (these features cannot be turned off via customer options form)	The Following Features not allowed: Remote Access/Barrier Code Modem Pooling	Extension Number Portability Main/Satellite
Capacities	Standard R6	Modified R6 (to Category B capacities)

Table B-2 shows the system capacities for each category.

System Capacity Limits

The maximum parameters for the DEFINITY hardware and software items are listed on the following pages. These parameters apply to compact single-carrier cabinets, compact modular cabinets, single-carrier cabinets, and multi-carrier cabinet systems in category A and category B.

Terminal and digital station capacities are reduced by such administered items as: attendant consoles, number of EAS login IDs, and number of ACD agents.

NOTE:
Not all maximum capacities listed in Table B-2 can be reached simultaneously with all versions or all configurations of the system. See Station Button Capacity for the system button limitations.

Table B-2. Maximum System Parameters (Category A/B)

	Release 6			
ITEM	R6vs (16 MB)	R6csi (16 MB)	R6si (16 MB)	R6r
Abbreviated Dialing (AD)				
AD lists per system	2400	2400	2400	5000
AD list entry size	24	24	24	24
AD entries per system	12,000	12,000	12,000	100,000
Auto dialing button				
Entries per system[1]	Note 1	Note 1	Note 1	Note 1
Enhanced list (system list)	1	1	1	1

Continued on next page

Table B-2. Maximum System Parameters (Category A/B) — *Continued*

ITEM	Release 6 R6vs (16 MB)	R6csi (16 MB)	R6si (16 MB)	R6r
Maximum entries	10,000/	10,000	10,000	10,000
Group lists	100	100	100	1000
Maximum entries	100	100	100	100
Group lists per extension	3	3	3	3
System list	1	1	1	1
Maximum entries	100	100	100	100
Personal lists	2400	2400	2400	5000
Maximum entries	100	100	100	100
Personal lists per extension	3	3	3	3
Applications Adjuncts				
CallVisor ASAI adjuncts[2]	8/NA	8/NA	8/NA	8/NA
Asynchronous links (RS-232)[3]	5	5	5	10
CDR output devices	2	2	2	2
Journal system printer	2:1	2:1	2:1	2:1
Property management systems	1	1	1	1
BX.25 physical links[4]	4	NA	8	16
Application processors	1/NA	NA	1/NA	7
Voice processing adjuncts				
Traditional AUDIX	1	NA	1	8
DEFINITY AUDIX DCP emulation	1	1	1	1
DEFINITY AUDIX control link	1	NA	1	1
INTUITY AUDIX				
INTUITY AUDIX (Via mode code)	1	1	1	1
INTUITY AUDIX (Via BX.25)	1	NA	1	8
INTUITY AUDIX (MAPD)	1	1	1	1
Mode code voice mail systems	1	1	1	1
Other adjuncts				
CMS adjuncts	1/NA	NA	1/NA	1
ICM adjuncts (ISDN gateway)	NA	NA	NA	NA
BX.25 processor channels	64	NA	64	128
Hop channels	64	NA	64	128
Automatic Call Distribution (ACD)				
Announcements per split	2	2	2	2

Continued on next page

Table B-2. Maximum System Parameters (Category A/B) — *Continued*

ITEM	Release 6 R6vs (16 MB)	R6csi (16 MB)	R6si (16 MB)	R6r
Announcements per system	128	128	128	256
Splits	99	99	99	600
ACD members per split	200	200	200	999
Split members per system	1000/ 150	1000/ 150	1000/ 150	10,000/150
Logged-In ACD agents	500/ 150	500/ 150	500/ 150	5,200/ 150
Logged-In splits per agent[5]				
No CMS	4	4[6]	4	4
R2 CMS	3/NA	NA[6]/NA	3/NA	3/NA
R3 CMS	3/NA	NA[6]/NA	3/NA	3/NA
R3V2 CMS	4/NA	NA[6]/NA	4/NA	4/NA
R3V4 CMS[7]	4/NA	NA[6]/NA	4/NA	4/NA
R3V5 CMS	4/NA	NA[6]/NA	4/NA	4/NA
Queue slots per group	200	200	200	999
Queue slots per system	1500	1500	1500	15,000
ARS/AAR[8]				
AAR/ARS patterns (shared)	254	254	254	640
ARS/AAR analysis tables	2000	2000	2000	2000
Choices per RHNPA table	12	12	12	12
Digit conversion entries	400	400	400	400
AAR/ARS digit conversion				
Digits deleted for ARS/AAR	28	28	28	28
Digits inserted for ARS/AAR	18	18	18	18
AAR/ARS sub-net trunking				
Digits deleted for ARS/AAR[9]	28	28	28	28
Digits inserted for ARS/AAR	36	36	36	36
Entries in each RHNPA table	1000	1000	1000	1000
FRLs	8	8	8	8
Inserted digit strings[10]	1200	1200	1200	3000
Patterns for measurement				
Shared patterns for measurement	20	20	20	25
RHNPA tables	32	32	32	32
Routing plans	8	8	8	8

Continued on next page

Table B-2. Maximum System Parameters (Category A/B) — *Continued*

ITEM	Release 6 R6vs (16 MB)	R6csi (16 MB)	R6si (16 MB)	R6r
ARS toll tables	32	32	32	32
Entries per toll table	800	800	800	800
Trunk groups in ARS/AAR pattern	6	6	6	16
UDP (entries)	10000	10000	10,000	50,000
TOD charts	8	8	8	8
Toll analysis table entries	1000	1000	1000	1000
Attendant Service				
Attendant consoles (day:night)[11]	6:1	15:1	15:1	27:1
Attendant console 100s groups per attendant	20	20	20	20
Attendant control restriction groups	96	96	96	96
Centralized attendant service				
Release link trunks at branch	99/NA	99/NA	99/NA	255/NA
Release link trunk groups at branch	1/NA	1/NA	1/NA	1/NA
Release link trunks at main	400/ NA	400/ NA	400/ NA	4000/ NA
Release link trunk groups at main[12]	99/NA	99/NA	99/NA	666/NA
Other access queues				
Maximum number of queues	12	12	12	12
Maximum number of queue slots[13]	80	80	80	80
Size range of reserved queue	2-75	2-75	2-75	2-75
Reserved queue default size	5	5	5	5
Queue length	80	80	80	300
Switched loops per console	6	6	6	6
Authorization				
Authorization codes	5000	5000	5000	90,000
Station security code length	7	7	7	7
Classes of restriction	96	96	96	96
Classes of service	16	16	16	16
Length of authorization code	4-7/NA	4-7/NA	4-7/NA	4-7/NA
Length of barrier code	4-7/NA	4-7/NA	4-7/NA	4-7/NA
Length of account codes	1-15	1-15	1-15	1-15
Restricted call list	1	1	1	1

Continued on next page

Table B-2. Maximum System Parameters (Category A/B) — *Continued*

ITEM	Release 6 R6vs (16 MB)	R6csi (16 MB)	R6si (16 MB)	R6r
Remote access barrier codes	10/NA	10/NA	10/NA	10/NA
CDR account code list	1	1	1	1
Toll call list	1	1	1	1
Unrestricted/allowed call lists	10	10	10	10
Total call list entries	1000	1000	1000	1000
Automatic Callback Calls	240	240	240	1500
Automatic Wakeup				
Simultaneous display requests	10	10	10	30
Wakeup requests per system	2400	2400	2400	15,000
Wakeup request per extension	1/NA	1/NA	1/NA	1/NA
Wakeup requests per 15-minute interval	450	450	450	950
Basic CMS (BCMS)				
Measured agents or Login IDs	400/20	400/20	400/20	2,000/ 20
Measured agents per split	200/20	200/20	200/20	999/20
Measured splits	99/5	99/5	99/5	600/5
Measured trunk groups	32	32	32	32
Measured VDNs	99/4	99/4	99/4	512/8
Maximum agents displayed by monitor BCMS split command[14]	100	100	100	100
Maximum BCMX terminals	3	3	3	4
Maximum active maintenance commands for the system	1	1	1	5
Maximum simultaneous BCMS terminals in monitor mode[15]	1	1	1	3
Reporting periods				
Intervals	25	25	25	25
Days	7	7	7	7
Cabinets				
Expansion port network (EPN)				
Multicarrier cabinet[16]	NA	NA	2	43
Single-carrier cabinet[16]	NA	NA	8	164
Small (upgrades only)[17]	NA	NA	2	41

Continued on next page

Table B-2. Maximum System Parameters (Category A/B) — *Continued*

ITEM	Release 6 R6vs (16 MB)	R6csi (16 MB)	R6si (16 MB)	R6r
Inter-port network connectivity				
Port networks	1	1	3	44
Maximum number of PNs per cabinet	1	1	1	2
Switch nodes (Simplex)	NA	NA	NA	3
Switch nodes (Duplex)	NA	NA	NA	6
DS1 converter complex (simplex)	NA	NA	NA	41
DS1 converter complex (duplex)	NA	NA	NA	82
Processor port network				
Multicarrier cabinet[18]	NA	NA	1	1
Single-carrier cabinet	NA	NA	4	NA
Compact Single-Carrier Cabinet	1	NA	NA	NA
Compact Modular Cabinet	NA	4	NA	NA
Call Appearances				
Bridged images per appearance[19]	26	26	26	26
Call appearances per station[20]	54	54	54	54
Maximum appearances per extension	10	10	10	10
Minimum appearances per extension	0	0	0	0
Total bridged appearances	2400	2400	2400	25,000
Maximum simultaneous off-hook per call[21]	5	5	5	5
Call Coverage				
Coverage answer groups (CAG)	200	200	200	750
Coverage paths	999	999	999	9999
Coverage paths including in call coverage report	100	100	100	100
Coverage path per station	4	4	4	4
Coverage points in a path	6/3	6/3	6/3	6/3
Remote coverage points	999	999	999	999
Maximum users per coverage path[22]	3500	3500	3500	36,065/3500
Members per coverage answer group	8	8	8	8
Time of day coverage tables	999	999	999	999

Continued on next page

Table B-2. Maximum System Parameters (Category A/B) — *Continued*

ITEM	Release 6 R6vs (16 MB)	R6csi (16 MB)	R6si (16 MB)	R6r
Time of day changes per table	5	5	5	5
Remote administration Coverage paths	2/NA	2/NA	2/NA	2/NA
Call Detail Recording				
Intra-switch call trackable extensions	1000	1000	1000	5000
Maximum number of CDR records buffered in switch	300	300	300	1900
Number of records buffered for the primary output device to cause secondary device to be busied out for 2 minutes	200	200	200	1800
Call Forwarding				
Call forwarded digits (off-net)	16	16	16	16
Call forwarded numbers	2400	2400	2400	25,000
Call Park				
Attendant group common shared extension numbers per system[23]	80	80	80	80
Number of Parked Calls	723	723	723	10,604
Call Pickup Groups				
Call pickup members per group	50	50	50	50
Call pickup members per system	2400	2400	2400	25,000
Number of groups	800	800	800	5000
Call Vectoring				
Maximum skills a call can simultaneously queue to	3	3	3	3
Priority levels	4	4	4	4
Recorded announcements/analog sources for vector delay	128	128	128	256
Steps per vector	32	32	32	32
Vector directory numbers	512/4	512/4	512/4	20,000/8
CMS measured VDNs[24]	512/NA	512/NA	512/NA	2000/NA
Vectors per system	256/4	256/4	256/4	512/8
Number of collected digits for call prompting or CINFO	16	16	16	16
Number of dial-ahead digits for call prompting	24	24	24	24

Continued on next page

Table B-2. Maximum System Parameters (Category A/B) — *Continued*

ITEM	Release 6 R6vs (16 MB)	R6csi (16 MB)	R6si (16 MB)	R6r
Vector routing tables	10	10	10	100
CallVisor ASAI				
Active station control associations	2000/NA	2000[25] /NA	2000/NA	6000/NA
Call controllers per call	1/NA	1[25]/NA	1/NA	1/NA
Call monitors per call	14/NA	14[25]/NA	14/NA	14/NA
Station controllers per station	2/NA	2[25]/NA	2/NA	2/NA
Maximum simultaneous call classifications	40/NA	40[25]/NA	40/NA	400/NA
Number of CallVisor ASAI links (open & proprietary)	8/NA	8[25]/NA	8/NA	8/NA
Notification requests (monitors)	300/ NA	300[25]/NA	300/NA	10,000/ NA
Simultaneous active call controlled calls	300/ NA	300[25]/NA	300/NA	3000/NA
Switch to adjunct associations (routing)	127/ NA	127[25]/NA	127/NA	127/NA
Number of open multiquest billing requests	100/NA	100[25]/NA	100/NA	1000/NA
Maximum calls with send DTMF active	16/NA	16[25]/NA	16/NA	32/NA
Selected listen - disconnect paths	75/NA	75[25]/NA	75/NA	300/NA
LAN gateway circuit pack maximum links	4/NA	NA/NA	4/NA	4/NA
Conference Parties	6	6	6	6
Simultaneous 3-way conference calls[26]	483	483	483	7084
Simultaneous 6-way conference calls[27]	240	240	240	3520
Data Parameters				
Administered connections	128	128	128	128
Alphanumeric dialing				
Maximum entries	200	200	200	1250
Characters per entry	22	22	22	22
PRI endpoints (PE)	25	8	25	50
Access endpoints (number of trunks)	400	400	400	4000

Continued on next page

Table B-2. Maximum System Parameters (Category A/B) — *Continued*

ITEM	Release 6 R6vs (16 MB)	R6csi (16 MB)	R6si (16 MB)	R6r
Multimedia Parameters				
TN787D MMI boards[28]	4/NA	4[25]/NA	4/NA	4/NA
TN788B VC boards[28]	32	32[25]/NA	32/NA	32/NA
Multimedia conferences per system	50/NA	800[25]/NA	800/NA	2000/NA
Maximum Number of BRI Connections	50/NA	84[25]/NA	1000/NA	7000/NA
MASI				
MASI nodes	15/NA	15/NA	15/NA	15/NA
MASI links	15/NA	15/NA	15/NA	15/NA
MASI trunk groups	96/NA	96/NA	96/NA	120/NA
Digital Data Endpoints	800	800	800	7500
Dial Plan				
Direct inward dialing listed directory numbers	8	8	8	20
Expert agent selection (EAS) agent login IDs[29]	1500/ NA	1500/ NA	1500/ NA	10,000/ NA
Extensions	3500	3500	3500	36,065
Extension number portability[30]	10,000	10,000	10,000	50,000
Feature dial access codes	77	77	77	77
Number of digits	1-4	1-4	1-4	1-4
Integrated directory entries[31]	2416	2416	2416	25,028
Maximum extension size	5	5	5	5
Minimum extension size	1	1	1	1
Miscellaneous extensions[32]	900	900	900	3317
Names				
Number of names[33]	4215	4215	4215	36,511
Number of characters in a name	27	27	27	27
Non-DID LDNs	50	50	50	666
Prefix extensions	Yes	Yes	Yes	Yes
Trunk dial access codes				
Number of access codes	317	317	317	884/317
Number of digits	1-4	1-4	1-4	1-4
Do Not Disturb (DND)				
Do not disturb requests per system	2400	2400	2400	25,000
Simultaneous display requests	10	10	10	30

Continued on next page

Table B-2. Maximum System Parameters (Category A/B) — *Continued*

ITEM	Release 6 R6vs (16 MB)	R6csi (16 MB)	R6si (16 MB)	R6r
External Device Alarming)	32	32	32	90
Expert Agent Selection (EAS)				
Skill groups	99/NA	99/NA	99/NA	600/NA
VDN skill preferences	3/NA	3/NA	3/NA	3/NA
Maximum skills a call can simultaneously queue to	3/NA	3/NA	3/NA	3/NA
Maximum agent login IDs administered	1500/ NA	1500 /NA	1500/ NA	10,000/NA
Maximum agent login IDs staffed	500/NA	500/NA	500/NA	5200/NA
Maximum agent/skill pairs administered	6000/ NA	6000/ NA	6000/ NA	40,000/NA
Maximum agent/skill Pairs staffed	1000/ NA	1000/ NA	1000/ NA	10,000/NA
Maximum skills per agent				
No CMS	20/NA	20[6]/NA	20/NA	20/NA
R3V2 CMS	4/NA	4/NA[6]	4/NA	4/NA
R3V4 CMS	4/NA	NA[6]/NA	4/NA	4/NA
R3V5 CMS	20/NA	NA[6]/NA	20/NA	20/NA
Maximum skill levels	16/NA	16[6]/NA	16/NA	16/NA
Maximum agents logged-in				
When each has 20 skills assigned	50/NA	50/NA	50/NA	500/NA
When each has 4 skills assigned	250/NA	250/NA	250/NA	2500/NA
When each has 1 skill assigned	500/NA	500/NA	500/NA	5200/NA
Facility Busy Indicators				
Buttons per tracked resource	100	100	100	500
Number of indicators (station and trunk groups)	3600	3600	3600	10,000
Hunt Groups (Non-ACD)				
Announcements per group	1/2	1/2	1/2	1/2
Announcements per system	128	128	128	256
Groups	99	99	99	600
Group members per group	200	200	200	999
Group members per system[34]	1000	1000	1000	10,000
Queue slots per group	200	200	200	999
Queue slots per system	1500	1500	1500	15,000

Continued on next page

Table B-2. Maximum System Parameters (Category A/B) — *Continued*

ITEM	Release 6 R6vs (16 MB)	R6csi (16 MB)	R6si (16 MB)	R6r
Intercom Translation Table (ICOM)				
Automatic/manual and dial				
ICOM groups per system	32	32	32	256
Auto/manual	32	32	32	256
Dial	32	32	32	256
Members per ICOM group				
Auto	32	32	32	32
Dial	32	32	32	32
Members per system	1024	1024	1024	8,192
Last Number Dialed				
Entries per system[35]	3216	3216	3216	32,528
Number of digits	24	24	24	24
Leave Word Calling (Switch-Based)[36]				
Messages stored	2000	2000	2000	6,000
Messages per user	125	125	125	125
Remote message waiting indicators				
Per extension	80/NA	80/NA	80/NA	80/NA
Per system	240/NA	240/NA	240/NA	1250/NA
Simultaneous message retrievers	60	60	60	400
System-wide message retrievers	10	10	10	10
Malicious Call Trace				
Maximum simultaneous traces	16	16	16	16
MLDN				
Via direct inward dialing	8	8	8	20
Via direct inward dialing with tenant partition	20/NA	20/NA	20/NA	100/NA
Via Central Office	99	99	99	666
Modem Pool Groups				
Mode 2/analog				
Group members per system	160/NA	160/NA	160/NA	2016/NA
Number of groups	5/NA	5/NA	5/NA	63/NA
Members per group	32/NA	32/NA	32/NA	32/NA
Multimedia Call Handling (MMCH)				

Continued on next page

Table B-2. Maximum System Parameters (Category A/B) — *Continued*

ITEM	Release 6 R6vs (16 MB)	R6csi (16 MB)	R6si (16 MB)	R6r
Maximum voice conditioner circuit packs[37]	32	NA	32	32
Maximum multimedia interface circuit packs	4	NA	4	4
Maximum multimedia conferences per system	50	NA	800	2000
Maximum number of BRI connections	50	NA	1000	7000
Networking				
Centralized Attendants Service (CAS) nodes	99/NA	99/NA	99/NA	99/NA
Distributed communications system (DCS) nodes[38]				
BX.25	20/NA	NA	20/NA	20/NA
ISDN PRI	20/NA	20/NA	20/NA	20/NA
Hybrid	20/NA	20/NA	20/NA	20/NA
EN nodes[39]	999/NA	999/NA	999/NA	999/NA
Paging				
Code calling IDs	125	125	125	125
Loudspeaker zones	9	9	9	9
Partitions[40]				
Attendant groups	15/NA	15/NA	15/NA	27/NA
Extension partition groups	8/NA	8/NA	8/NA	8/NA
Extension partition	8/NA	8/NA	8/NA	8/NA
Tenant partition	20/NA	20/NA	20/NA	100/NA
Multiple music-on-hold sources	20/NA	20/NA	20/NA	100/NA
Personal CO Lines (PCOL)				
PCOL appearances	16	16	16	16
PCOL lines (trunk groups)	200	200	200	200
PCOL trunks per trunk group	1	1	1	1
Port Circuit Pack Slots[41]				
Per expansion port network				
Multicarrier cabinet standard reliability	NA	NA	99	99
Single-carrier cabinet standard reliability	NA	NA	71	71

Continued on next page

Table B-2. Maximum System Parameters (Category A/B) — *Continued*

ITEM	Release 6 R6vs (16 MB)	R6csi (16 MB)	R6si (16 MB)	R6r
Small cabinet standard reliability (upgrade only)	NA	NA	39	39
Per processor port network				
Multicarrier cabinet standard reliability	NA	NA	89	80
Single-carrier cabinet standard reliability	NA	NA	64	NA
Enhanced single-carrier cabinet standard reliability	NA	NA	70	NA
Compact single-carrier cabinet	10	NA	NA	NA
Compact modular cabinet	NA	38[37]	NA	NA
Recorded Announcements/Audio Sources				
Analog and auxiliary trunk announcements				
Analog and auxiliary trunk queue slots per Announcement	150	150	150	1000
Analog and auxiliary trunk queue slots per System	150	150	150	1000
Calls connected per announcement	50	150	150	1000
Integrated announcements				
Integrated announcement circuit packs	5	5	5	10
Channels connected per integrated Announcement circuit pack	16	16	16	16
Calls connected per integrated announcement	50	50	50	1000
Integrated announcement recording time (minutes: seconds) per circuit pack				
16 kB recording	8:32	8:32	8:32	8:32
32 kB recording	4:16	4:16	4:16	4:16
64 kB recording	2:08	2:08	2:08	2:08
Integrated queue slots per system	200	200	200	4000
Total recorded announcements	128	128	128	256
System Administration				

Continued on next page

Table B-2. Maximum System Parameters (Category A/B) — *Continued*

ITEM	Release 6 R6vs (16 MB)	R6csi (16 MB)	R6si (16 MB)	R6r
Number of logins	15	15	15	15
Administrable history file entries	500	500	500	1250
Simultaneous administration command	1	1	1	5
Simultaneous maintenance command	1	1	1	5
Simultaneous system maintenance sessions	5	5	5	8
Number of scheduled reports	50	50	50	50
Speech Synthesis Circuit Packs	6	6	6	40
Channels per speech circuit pack	4	4	4	4
Terminating Extension Groups (TEG)				
TEGs	32	32	32	32
Users that may share a TEG	4	4	4	4
Time Slots				
Simultaneous circuit-switched calls[42]	241	241[43]	723	7712
Total slots	512			
Time slots for voice and data[44]	483	483[43]	1449	21,208
Time slots per port network	512	512[43]	512	512
Tone Classifiers				
Tone receivers (general)[45]	200	200	200	840
TTR queue size	4	4	4	4
Prompting TTR queue size	80	80	80	80
Trunks				
DS1 circuit packs	30	30	30	166
Queue slots for trunks	198	198	198	1332
PRI interfaces	30	8	30	166
PRI interfaces via processor interface[46]	4	NA	8	NA
PRI interfaces via PACCON[47] (packet controller)	30 [25]	NA	30	NA
PRI interfaces via TN1655 PKTINT	NA	NA	NA	166
BRI trunks[48]				
BRI interfaces via PACCON (packet controller)	240[25]	NA	240	NA

Continued on next page

Table B-2. Maximum System Parameters (Category A/B) — *Continued*

ITEM	Release 6 R6vs (16 MB)	R6csi (16 MB)	R6si (16 MB)	R6r
BRI trunks via TN1655 PKTINT	NA	NA	NA	1328
BRI via time division multiplexing (TDM) bus	NA	64	NA	NA
BRI trunks total	240[25]	64	240	1328
PRI temporary signaling connections (TSCs)				
TSCs in system	656	656	656	4256
Call associated TSCs	400	400	400	4000
Non call associated TSCs	256	256	256	256
Administered TSCs	128	128	128	128
Ringback queue slots	198	198	198	1332
Trunk groups				
Trunk groups hourly measurements	25	25	25	75
Trunk groups in the system	99	99	99	666
Trunk members in a trunk group	99	99	99	255
Trunks in system (including remote access)	400	400	400	4000
Measured Trunks in system	400	400	400	4000
ISDN services				
Incoming call handling treatment (per trunk group)	18	18	18	54
Incoming call handling treatment (per trunk system)	288	288	288	576
User defined services	24	24	24	60
Usage allocation entries (per plan)	15	15	15	15
ISDN PRI Usage				
ICHT entries/trunk grp	18	18	18	54
ICHT entries/system	288	288	288	576
User defined services	24	24	24	60
Usage allocation entries/plan	15	15	15	15
Voice Terminals[49]				
Associated data modules (such as DTDMs)	800	800	800	7500
BRI stations[50]				
Point-to-Point	1000[25]	84	1000	7000

Continued on next page

Table B-2. Maximum System Parameters (Category A/B) — *Continued*

ITEM	Release 6 R6vs (16 MB)	R6csi (16 MB)	R6si (16 MB)	R6r
Multipoint	1000[25]	84	1000	7000
Digital stations[51]	2400	168	2400	25,000
Display stations	2400	2400	2400	10,000
Stations[52]	2400	2400	2400	25,000
Station button capacity (K Units)[53]	700.8	700.8	700.8	5260
Station button feature capacity[54]	15,900	15,900	15,900	15,900
VuStats				
Measured agents or login IDs	400/NA	400/NA	400/NA	2,000/NA
Measured splits	99/NA	99/NA	99/NA	600/NA
Measured trunk groups	32/NA	32/NA	32/NA	32/NA
Measured VDNs	99/NA	99/NA	99/NA	512/NA
Reporting periods				
Intervals	25/NA	25/NA	25/NA	25/NA
Days	1/NA	1/NA	1/NA	1/NA
Displays				
Display formats	50/NA	50/NA	50/NA	50/NA
Simultaneous updating displays	100/NA	100/NA	100/NA	500/NA
DEFINITY Wireless Business System				
Maximum number of terminals (9601)	250	250	250	250
Radio controller circuit packs[55]	8	30	30	30
Wireless fixed bases	16	60	60	60
Cell antenna units (CAU)	64	240	240	240
Coverage (million square feet)	1	3	3	3
Button capacity for wireless	700.8	700.8	700.8	5260

Continued on next page

1. There is no limit on the maximum number of auto dial buttons (other than the system limit on button capacity). See Station Button Capacity for system button limitations.
2. #VS models must have the J58890S-2 L8 CSCC hardware to support Paccon, BRI or ASAI.
3. In si, 4 netcon channels plus one direct connect. In G3r, 10 system ports through the packet data circuit pack.
4. In SCC/ESCC/CSCC, only 4 BX.25 physical links are supported in the configuration.
5. When going from 4 to 3 login maximums, a change to the hunt group form is required. This requires all agents to be logged-out. In one extreme case, this is potentially avoided and R2 & R3 CMS handles the fourth login as UNSTAFFED appropriately.
6. The Release 6csi platform does not support CMS.
7. R3V3 CMS was renamed to R3V4 CMS to match the DEFINITY System numbering.
8. AAR was Not An Optional Feature in the G3vsV4G3/G3sV4 ABP.
9. Plus up to 7 inter-exchange carrier (IXC) digits.

10. Number of available 12 character inserted-digit-strings available for AAR/ARS preferences.
11. For Release 6vs, 4 is the recommended number of consoles supported due to power limitations. Of these, 1 may be used as a night console. The software supports 6:1 day/night attendant consoles.
12. This is the same as the number of trunk groups in the system.
13. Referred to as ‘‘emergency access queue length’’ in Release 6si.
14. The monitor split command displays status for the first 100 agents logged into the split regardless of how many additional agents log into the split.
15. BCMS monitoring is a maintenance command limited by the active maintenance commands limit. It is reduced by 2 in the r system configuration because 2 active command slots are reserved for the INADS and SAT logins.
16. Only EPNs in Release 6r can be DS1-remote EPNs.
17. Small systems refer to the 2 carrier cabinet systems that are no longer sold to new customers.
18. Multicarrier cabinet includes the medium Cabinet.
19. 26 bridged appearances (principal + 25) are supported on all R6 platforms, provided that ASAI is not used. The capacity is 16 with ASAI.
20. The number of call appearances is the sum of primary and bridged appearances; at most 10 can be primary. A maximum of 54 administrable buttons are supported for the 8434D terminal with expansion module — 34 buttons in the basic terminal and 20 more buttons in the expansion module.
21. Does not apply to conferencing.
22. The maximum number of users per coverage path equals the number of extensions.
23. Shared extensions must be shared among all attendant groups in the system including tenant partition scenarios.
24. Measured limits depend on the CMS release used.
25. BRI stations and ASAI are supported on R6.2csi and CMC only with TN556C. The TN2198 is not supported on R6.2csi or CMC.
26. Simultaneous 3-way conference call = (483 / 3)* number PNs.
27. Simultaneous 6-way conference call = (483 / 6)* number PNs.
28. This feature is introduced in the Release 5.4 load and is not available in previous R5 loads.
29. Login IDs count against the “extensions” switch capacity.
30. These are uniform dialing plan (UDP) entries.
31. The integrated directory entries = stations + attendant consoles.
32. Used for PCOL groups, common shared extensions, access endpoints, administered TSCs, code calling IDs, LDNs, hunt groups, announcements, and TEGs (phantom extensions).
33. The number of names = number of stations + attendant consoles + trunk groups + digital data endpoints + miscellaneous extensions.
34. Hunt group members include non-ACD (hunting, message center service, AUDIX, and so forth) and ACD uses (splits or skills including auto-available split or skills).
35. The last number dialed entries = stations + digital data endpoints + attendant consoles.
36. Leave WOrd Calling is available in the APB only if the Voice Mail Option is purchased.
37. The MMCH circuit packs can only install in 1 port network per system (PPN or EPN, not both).
38. The actual software limit is 63, but due to performance considerations the recommended number of DCS nodes is 20.
39. These are node number addresses.
40. G3V2 and G3V3 do not support Tenant Partitioning.
41. Only port slots are included in this count. For example, there are 100 port slots per MCC EPN cabinet with 99 port slots and one slot dedicated to the Tone/Clock board. Other service circuits may further reduce the number of port slots available. In Release 6r and Release 6si, the service slot may be equipped with service boards that do not require tip and ring connections.
42. 241 simultaneous circuit-switched calls per port network, except for Release 6si with 180 simultaneous circuit switched calls and Release 6r with 7,712 (limited by the number of call records supported).
43. R6csi supports PRI D channels over the TDM bus. Each D channel for PRI uses one timeslot pair. An R6csi with 8 PRIs utilize 8 timeslot pairs, allowing a maximum of 233 simultaneous circuit switched calls.
44. 483 time slots for voice and data per port network.
45. G3V4 and Release 6 use TN744C Call Classifier for basic TTR usage as well as call prompting/call classification/MFC. Also, the TN2182 Tone/Clock/Detector is used for multiple tone detection functions. The number of TN748, TN420, or TN744C circuit packs is limited only by the number of available slots. The number of TN2182 boards is limited. There is a single limit on the total number of tone receiver (classifier) ports for the system: TN748/TN420 have 4 ports for TTR use, TN748/TN420 have 2 ports for GPTD use, TN744C has 8 ports for call prompting/call classification/ MFC/TTR/GPTD use, and TN2182 has 8 ports for call prompting/call classification/MFC/ TTR/GPTD use.

46. Only 1 processor interface (PI) circuit pack is supported in Release 6vs and Release 6si configurations, therefore a total of 4 physical links (used for BX.25 or PRI) are available. PRI interface via the PI is not available in France, Germany, and Italy. PRI interface via the packet controller is used.
47. Other countries must use the PI when they have the Release 6vs configuration without packet bus capability.
48. The TN2185 BRI trunk circuit pack provides 8 ports. Each port (2B+D) provides 2 BRI trunks.
49. The following items detract from the total number of available "stations:"

    Analog music-on-hold

    Attendants

    Modem pool conversion resources

    TAAS port

    Stations (digital, display, BRI, and so forth.)

    Analog announcements

    Analog external alarm port

    Agent login IDs

    ACD agents
50. All BRI stations can be display stations. Release 6vs can have up to 50 BRI stations if the unit is configured for packet interface.
51. The software limit for digital stations in Release 6vs is 400. Due to power limitations, 120 is the recommended limit.
52. Including extensions administered without associated hardware (Release 6si and Release 6r). The station capacity for Release 6vs is a software limit because of the physical capacity (10 port slots).
53. The station button capacity can support all stations equipped as 8410D digital sets with display. For example, a total of (292 x 2400) = 700.8K units. The table below shows approximate unit values for various station types. The term "default" means with no non-default buttons administered. The term "loaded" means all possible buttons - including the indicated number of call/bridged appearances (CA) - administered.

    8403B (default): 32

    8403B (loaded with 3 CA): 152

    8410B (default): 32
54. The following button features share a common resource in memory:
    Call Forwarding, Call Forward Busy Don't Answer, Send Extension Calls (SAC w/extension), Station Busy Indicators, Trunk Group Status, Hunt Group Status, PCOL GRoup Status, Data Module, Terminating Extension Group Status, Attendant Group Status/DXS, Remote Trunk Group Select.
55. For G3r, TN789 Radio COntroller Circuit Packs cannot be used in DS1 remoted EPNs.

References

C

This section contains a list of user documents for the DEFINITY Enterprise Communications Server (ECS) Release 6.

To order these or other DEFINITY documents, contact the Lucent Technologies Publications Center at the address and phone number on the back of the title page of this document. A complete catalog of Business Communications Systems (BCS) documents, including previous issues of the documents listed here, is available on the World Wide Web. Ask your account team for the web address.

Basic DEFINITY ECS Documents

These documents are issued for all new and upgrade DEFINITY ECS Release 6 systems.

Administration

***DEFINITY ECS Release 6 — Overview, Issue 5*, 555-230-024**

Provides a detailed overview of the ECS including descriptions of many of the major features, applications, hardware, system capabilities, and the support provided with the system. This document is available in the following languages: English, German (DE), Dutch (NL), Brazilian Portuguese (PTB), European French (FR), Latin Spanish (SPL), Italian (IT), Russian (RU), and Japanese (JA). To order, append the language suffix to the document number; for example, 555-230-894DE for German. No suffix is needed for the English version.

***DEFINITY ECS Release 6.2 — Change Description, Issue 1,* 555-230-476**

Gives a high-level overview of what is new in DEFNITY ECS Release 6. Describes the hardware and software enhancements and lists the problem corrections for this release.

***DEFINITY ECS Release 6 — System Description Pocket Reference, Issue 2,* 555-230-211**

Provides hardware descriptions, system parameters, listing of hardware required to use features, system configurations, and environmental requirements. This compact reference combines and replaces Release 6 *System Description and Specifications* and Release 6 *Pocket Reference*.

***DEFINITY ECS Release 6 — Administration and Feature Description, Issue 3*, 555-230-522**

Provides descriptions of system features. Also provides step-by-step procedures for preparing the screens that are required to implement the features, functions, and services of the system. Includes the applications and benefits, feature interactions, administration requirements, hardware requirements, and procedures for voice terminal, data module, and trunk group administration.

***DEFINITY System's Little Instruction Book, Issue 3,* 555-230-727**

Provides step-by-step procedures for performing basic switch administration tasks. Includes managing phones, managing features, generating reports, enhancing system security, and troubleshooting.

***DEFINITY ECS Release 5 — System Monitoring and Reporting, Issue 4,* 555-230-511**

Provides detailed descriptions of the measurement, status, security, and recent change history reports available in the system and is intended for administrators who validate traffic reports and evaluate system performance. Includes corrective actions for potential problems. Issue 2 of this document was titled *Traffic Reports*. The Release 5 version of this document applies to Release 6 as well.

***DEFINITY ECS Release 5 — Implementation Blank Forms, Issue 3*, 555-230-303**

Provides blank paper forms corresponding to the screens that are required to implement the features, functions, and services of the system. The Release 5 forms apply to Release 6 as well.

Installation and Maintenance

***DEFINITY ECS Release 6 — Installation and Test for Single-Carrier Cabinets, Issue 3*, 555-230-894**

Provides procedures and information for hardware installation and initial testing of single-carrier cabinets.The Release 5 version of this document applies to Release 6 as well.

This document is available in the following languages: English, German (DE), Dutch (NL), Brazilian Portuguese (PTB), European French (FR), Castillian Spanish (SP), Italian (IT), Russian (RU), and Japanese (JA). To order, append the language suffix to the document number; for example, 555-230-894DE for German. No suffix is needed for the English version.

DEFINITY ECS Release 6 — Installation and Upgrades for CSCC, Issue 1, **555-230-124**

Provides procedures and information for hardware installation, upgrades, and initial testing of compact single-carrier cabinets. The Release 5 version of this document applies to Release 6 as well.

DEFINITY ECS Release 6 — Installation and Test for Multi-Carrier Cabinets, Issue 4, **555-230-112**

Provides procedures and information for hardware installation and initial testing of multi-carrier cabinets.

DEFINITY ECS Release 6 — Installation and Test for Compact Modular Cabinets, Issue 2, **555-230-128**

Provides procedures and information for hardware installation and initial testing of compact modular cabinets.

DEFINITY ECS Release 6 — Installation for Adjuncts and Peripherals, Issue 3, **555-230-125**

Provides procedures and information for hardware installation and initial testing of ECS adjunct and peripheral systems and equipment.

DEFINITY ECS Release 6 — Upgrades and Additions for R6r, Issue 4, **555-230-121**

Provides procedures for an installation technician to convert an existing Generic 3 Version 4 DEFINITY Communications System to DEFINITY ECS and from DEFINITY ECS Release 5 to DEFINITY ECS Release 6.

Included are upgrade considerations, lists of required hardware, and step-by-step upgrade procedures. Also included are procedures to add control carriers, switch node carriers, port carriers, circuit packs, auxiliary cabinets, and other equipment.

DEFINITY ECS Release 6 — Upgrades and Additions for R6vs/si, Issue 4, **555-230-120**

Provides procedures for an installation technician to convert an existing DEFINITY Communications System Generic 3 Version 4 to DEFINITY ECS and from DEFINITY ECS Release 5 to DEFINITY ECS Release 6.

Included are upgrade considerations, lists of required hardware, and step-by-step upgrade procedures. Also included are procedures to add control carriers, switch node carriers, port carriers, circuit packs, auxiliary cabinets, and other equipment.

***DEFINITY ECS* Release 6 — *Maintenance for R6r, Issue 2*, 555-230-126**

Provides detailed descriptions of the procedures for monitoring, testing, troubleshooting, and maintaining the R6r ECS. Included are maintenance commands, step-by-step trouble-clearing procedures, the procedures for using all tests, and explanations of the system's error codes.

***DEFINITY ECS Release 6 — Maintenance for R6vs/si, Issue 2*, 555-204-127**

Provides detailed descriptions of the procedures for monitoring, testing, troubleshooting, and maintaining the R6vs/si ECS. Included are maintenance commands, step-by-step trouble-clearing procedures, the procedures for using all tests, and explanations of the system's error codes.

***DEFINITY ECS Release 6 — Maintenance for R6csi (Compact Modular Cabinets), Issue 2*, 555-204-129**

Provides detailed descriptions of the procedures for monitoring, testing, troubleshooting, and maintaining the R6csi ECS. Included are maintenance commands, step-by-step trouble-clearing procedures, the procedures for using all tests, and explanations of the system's error codes.

***BCS Products Security Handbook, Issue 6*, 555-025-600**

Provides information about the risks of telecommunications fraud and measures for addressing those risks and preventing unauthorized use of BCS products. This document is intended for telecommunications managers, console operators, and security organizations within companies.

***DEFINITY ECS* Release 6— *Terminals and Adjuncts Reference, Issue 9*, 555-015-201**

Provides descriptions of the peripheral equipment that can be used with System 75, System 85, DEFINITY Communications System, and DEFINITY ECS. This document is intended for customers and Lucent Technologies account teams for selecting the correct peripherals to accompany an ECS. The Release 5 version of this document applies to Release 6 as well.

***DEFINITY ECS — Telephone Guide Builder, Issue 4*, 555-230-755**

Provides capability to produce laser-printed documentation for specific telephones. The software is supported by a comprehensive user's guide and on-line help. This product requires a 386 PC, minimum of 6MB disk space, minimum of 4MB RAM, a printer supported by Microsoft GDI printer drive, and Microsoft Windows 3.1 or higher. A mouse is recommended. This document applies to Release 6 as well as earlier DEFINITY systems.

Call Center Documents

These documents are issued for DEFINITY ECS Call Center applications.

DEFINITY

***DEFINITY ECS Release 6 — Call Vectoring/EAS Guide, Issue 1*, 585-230-521**

Provides information on how to write, use, and troubleshoot vectors, which are command sequences that process telephone calls in an Automatic Call Distribution (ACD) environment. This document applies to Release 6 as well as earlier DEFINITY systems.

It is provided in two parts: tutorial and reference. The tutorial provides step-by-step procedures for writing and implementing basic vectors. The reference includes detailed descriptions of the call vectoring features, vector management, vector administration, adjunct routing, troubleshooting, and interactions with management information systems (including the Call Management System).

***DEFINITY ECS Release 6 — Basic Call Management System (BCMS) Operations, Issue 1*, 555-230-706**

Provides detailed instructions on how to generate reports and manage the system. It is intended for telecommunications managers who wish to use BCMS (Basic Call Management System) reports and for system managers responsible for maintaining the system. This documentation applies to Release 6 as well as earlier DEFINITY systems.

CentreVu CMS

***CentreVu Call Management System Release 3 Version 5 — Administration, Issue 1,* 585-215-820**

***CentreVu Call Management System Release 3 Version 5 — Reports, Issue 1,* 585-215-821**

***CentreVu Call Management System Release 3 Version 5 — Custom Reports, Issue 1,* 585-215-822**

***CentreVu Call Management System Release 3 Version 5 — Upgrades and Migrations, Issue 1,* 585-215-826**

***CentreVu Call Management System Release 3 Version 5 — External Call History Reference, Issue 1,* 585-215-824**

***CentreVu Call Management System Release 3 Version 5 — Forecast, Issue 1,* 585-215-825**

Application-Specific Documents

These documents support specific DEFINITY applications.

***DEFINITY ECS Generic 2 to Release 5 — Transition Reference, Issue 1,* 555-230-523**

Provides information on the differences in features and administration between the old and new systems when upgrading from a Generic 2 system to DEFINITY ECS Release 5.

ASAI

***DEFINITY ECS Release 6 — CallVisor ASAI Planning Guide, Issue 4*, 555-230-222**

Provides procedures and directions for the account team and customer personnel for effectively planning and implementing the CallVisor Adjunct/Switch Application Interface (ASAI) PBX-Host environment. The CallVisor ASAI is a communications interface that allows adjunct processors to access switch

features and to control switch calls. It is implemented using an Integrated Services Digital Network (ISDN) Basic Rate Interface (BRI). Hardware and software requirements are included.

***DEFINITY ECS Release 6 — CallVisor ASAI Protocol Reference, Issue 7*, 555-230-221**

Provides detailed layer 3 protocol information regarding the CallVisor Adjunct/Switch Application Interface (ASAI) for the systems and is intended for the library or driver programmer of an adjunct processor to create the library of commands used by the applications programmers. Describes the ISDN message, facility information elements, and information elements.

***DEFINITY ECS Release 6 — CallVisor ASAI Technical Reference, Issue 7,* 555-230-220**

Provides detailed information regarding the CallVisor Adjunct/Switch Application Interface (ASAI) for the systems and is intended for the application designer responsible for building and/or programming custom applications and features.

***DEFINITY ECS Release 6 — CallVisor ASAI DEFINITY LAN Gateway over MAP-D Installation, Administration, and Maintenance of, Issue 1*, 555-230-114**

Provides procedures for installation, administration, and maintenance of the CallVisor Adjunct/Switch Application Interface (ASAI) Ethernet application over the DEFINITY LAN Gateway and is intended for system administrators, telecommunications managers, Management Information System (MIS) managers, LAN managers, and Lucent personnel. The ASAI-Ethernet application provides ASAI functionality using 10Base-T Ethernet rather than BRI as a transport media.

***DEFINITY ECS Release 6 — CallVisor ASAI PC LAN over MAP-D Installation, Administration, and Maintenance of, Issue 1*, 555-230-113**

Provides procedures for installation, administration, and maintenance of the CallVisor Adjunct/Switch Application Interface (ASAI) Ethernet application over the PC LAN and is intended for system administrators, telecommunications managers, Management Information System (MIS) managers, LAN managers, and Lucent personnel. The ASAI-Ethernet application provides ASAI functionality using 10Base-T Ethernet rather than BRI as a transport media.

***DEFINITY ECS Release 6 — Call Visor ASAI Overview, Issue 2,* 555-230-225**

Provides a general description of Call Visor ASAI.

This document is available in the following languages: English, German (DE), Dutch (NL), Brazilian Portuguese (PTB), European French (FR), Colombian Spanish (SPL), and Japanese (JA). To order, append the language suffix to the document number; for example, 555-230-894DE for German. No suffix is needed for the English version.

***DEFINITY ECS Release 6* — CallVisor PC ASAI Installation and Reference, Issue 3, 555-230-227**

Provides procedural and reference information for installers, Tier 3 support personnel, and application designers.

ACD

***DEFINITY ECS Release 6 — Automatic Call Distribution (ACD) Agent Instructions, Issue 5*, 555-230-722**

Provides information for use by agents after they have completed ACD training. Includes descriptions of ACD features and the procedures for using them.

***DEFINITY ECS Release 6 — Automatic Call Distribution (ACD) Supervisor Instructions, Issue 4*, 555-230-724**

Provides information for use by supervisors after they have completed ACD training. Includes descriptions of ACD features and the procedures for using them.

Call Detail Recording

***Call Detail Acquisition & Processing Reference*, Issue 2, 555-006-202**

Provides a general technical description of the ECS call detail recording feature and of the products that collect, store, poll, and process call records.

Console Operations

***DEFINITY Communications System Generic 1 and Generic 3 Console Operations, Issue 3*, 555-230-700**

Provides operating instructions for the attendant console. Included are descriptions of the console control keys and functions, call-handling procedures, basic system troubleshooting information, and routine maintenance procedures.

***DEFINITY ECS Release 6 — Console Operations Quick Reference, Issue 3*, 555-230-890**

Provides operating instructions for the attendant console. Included are descriptions of the console control keys and functions, call handling, basic system-troubleshooting information, and routine maintenance procedures.

This document is available in the following languages: English, German (DE), Dutch (NL), Brazilian Portuguese (PTB), European French (FR), Colombian Spanish (SPL), and Japanese (JA). To order, append the language suffix to the document number; for example, 555-230-894DE for German. No suffix is needed for the English version.

Hospitality

***An Introduction to DEFINITY Communications System Generic 3 Hospitality Services, Issue 1*, 555-230-021**

Provides an overview of the features available for use by the lodging and health industries to improve their property management and to provide assistance to their employees and clients. Included are brief definitions of many of the system features, descriptions of the hardware, planning considerations, and list of the system capabilities. This documentation also applies to Release 6.

***DEFINITY ECS Release 6 — Hospitality Operations*, *Issue 4*, 555-230-723**

Provides step-by-step procedures for using the features available for the lodging and health industries to improve their property management and to provide assistance to their employees and clients. Includes detailed descriptions of reports.

Glossary and Abbreviations

Numerics

3B2 Message Server
A software application that combines voice and data messaging services for voice-terminal users whose extensions are connected to a system.

800 service
A service in the United States that allows incoming calls from certain areas to an assigned number for a flat-rate charge based on usage.

A

AA
Archangel. See angel.

AAC
ATM access concentrator

AAR
See Automatic Alternate Routing (AAR).

abandoned call
An incoming call in which the caller hangs up before the call is answered.

Abbreviated Dialing (AD)
A feature that allows callers to place calls by dialing just one or two digits.

AC
1. Alternating current.
2. See Administered Connection (AC).

AAR
Automatic Alternate Routing

ACA
See Automatic Circuit Assurance (ACA).

ACB
See Automatic Callback (ACB).

ACD
See Automatic Call Distribution (ACD).

ACD agent
See agent.

ACU
See Automatic calling unit (ACU)

ACW
See after-call work (ACW) mode.

access code
A 1-, 2-, or 3-digit dial code used to activate or cancel a feature, or access an outgoing trunk.

access endpoint
Either a nonsignaling channel on a DS1 interface or a nonsignaling port on an analog tie-trunk circuit pack that is assigned a unique extension.

access tie trunk
A trunk that connects a main communications system with a tandem communications system in an electronic tandem network (ETN). An access tie trunk can also be used to connect a system or tandem to a serving office or service node. Also called access trunk.

access trunk
See access tie trunk.

ACCUNET
A trademarked name for a family of digital services offered by AT&T in the United States.

ACD
See Automatic Call Distribution (ACD). ACD also refers to a work state in which an agent is on an ACD call.

ACD work mode
See work mode.

active-notification association
A link that is initiated by an adjunct, allowing it to receive event reports for a specific switch entity, such as an outgoing call.

active-notification call
A call for which event reports are sent over an active-notification association (communication channel) to the adjunct. Sometimes referred to as a monitored call.

active notification domain
VDN or ACD split extension for which event notification has been requested.

ACU
See Automatic calling unit (ACU).

AD
See Abbreviated Dialing (AD).

ADAP
AUDIX Data Acquisition Package

ADC
See analog-to-digital converter (ADC).

adjunct
A processor that does one or more tasks for another processor and that is optional in the configuration of the other processor. See also application.

adjunct-control association
A relationship initiated by an application via *Third Party Make Call*, the *Third Party Take Control,* or *Domain (Station) Control* capabilities to set up calls and control calls already in progress.

adjunct-controlled call
Call that can be controlled using an adjunct-control association. Call must have been originated via *Third Party Make Call* or *Domain (Station) Control* capabilities or must have been taken control of via *Third Party Take Control* or *Domain (Station) Control* capabilities.

adjunct-controlled split
An ACD split that is administered to be under adjunct control. Agents logged into such splits must do all telephony work, ACD login/ logout, and changes of work mode through the adjunct (except for auto-available adjunct-controlled splits, whose agents may not log in/out or change work mode).

adjunct-monitored call
An adjunct-controlled call, active-notification call, or call that provides event reporting over a domain-control association.

Adjunct-Switch Application Interface (ASAI)
A recommendation for interfacing adjuncts and communications systems, based on the CCITT Q.932 specification for layer 3.

ADM
Asynchronous data module

administer
To access and change parameters associated with the services or features of a system.

Administered Connection (AC)
A feature that allows the switch to automatically establish and maintain end-to-end connections between access endpoints (trunks) and/or data endpoints (data modules).

administration group
See capability group.

administration terminal
A terminal that is used to administer and maintain a system. See also terminal.

Administration Without Hardware (AWOH)
A feature that allows administration of ports without associated terminals or other hardware.

ADU
See asynchronous data unit (ADU).

AE
See access endpoint.

after-call work (ACW) mode
A mode in which agents are unavailable to receive ACD calls. Agents enter the ACW mode to perform ACD-related activities such as filling out a form after an ACD call.

AG
ASAI Gateway

agent
A person who receives calls directed to a split. A member of an ACD hunt group or ACD split. Also called an ACD agent.

agent report
A report that provides historical traffic information for internally measured agents.

AIM
Asynchronous interface module

AIOD
Automatic Identification of Outward Dialing

ALBO
Automatic Line Build Out

All trunks busy (ATB)
The state in which no trunks are available for call handling.

ALM-ACK
Alarm acknowledge

American Standard Code for Information Interchange
See ASCII (American Standard Code for Information Interchange).

AMW
Automatic Message Waiting

AN
Analog

analog
The representation of information by continuously variable physical quantities such as amplitude, frequency, and phase. See also digital.

analog data
Data that is transmitted over a digital facility in analog (PCM) form. The data must pass through a modem either at both ends or at a modem pool at the distant end.

analog telephone
A telephone that receives acoustic voice signals and sends analog electrical signals along the telephone line. Analog telephones are usually served by a single wire pair (tip and ring). The model-2500 telephone set is a typical example of an analog telephone.

analog-to-digital converter (ADC)
A device that converts an analog signal to digital form. See also digital-to-analog converter (DAC).

angel
A microprocessor located on each port card in a processor port network (PPN). The angel uses the control-channel message set (CCMS) to manage communications between the port card and the archangel on the controlling switch-processing element (SPE). The angel also monitors the status of other microprocessors on a port card and maintains error counters and thresholds.

ANI
See Automatic Number Identification (ANI).

ANSI
American National Standards Institute**.** A United States professional/technical association supporting a variety of standards.

answerback code
A number used to respond to a page from a code-calling or loudspeaker-paging system, or to retrieve a parked call.

AOL
Attendant-offered load

AP
Applications processor

APLT
Advanced Private-Line Termination

appearance
A software process that is associated with an extension and whose purpose is to supervise a call. An extension can have multiple appearances. Also called call appearance, line appearance, and occurrence. See also call appearance.

application
An adjunct that requests and receives ASAI services or capabilities. One or more applications can reside on a single adjunct. However, the switch cannot distinguish among several applications residing on the same adjunct and treats the adjunct, and all resident applications, as a single application. The terms application and adjunct are used interchangeably throughout this document.

applications processor
A micro-computer based, program controlled computer providing application services for the DEFINITY switch. The processor is used with several user-controlled applications such as traffic analysis and electronic documentation.

application service element
See capability group.

architecture
The organizational structure of a system, including hardware and software.

ARS
See Automatic Route Selection (ARS).

ASAI
See Adjunct-Switch Application Interface (ASAI)

ASCII (American Standard Code for Information Interchange)
The standard code for representing characters in digital form. Each character is represented by an 8-bit code (including parity bit).

association
A communication channel between adjunct and switch for messaging purposes. An active association is one that applies to an existing call on the switch or to an extension on the call.

asynchronous data transmission
A method of transmitting data in which each character is preceded by a start bit and followed by a stop bit, thus permitting data characters to be transmitted at irregular intervals. This type transmission is advantageous when transmission is not regular (characters typed at a keyboard). Also called asynchronous transmission. See also synchronous data transmission.

asynchronous data unit (ADU)
A device that allows direct connection between RS-232C equipment and a digital switch.

asynchronous Transfer Mode (ATM)
A packet-like switching technology in which data is transmitted in fixed-size (53-byte) cells. ATM provides high-speed access for data communication in LAN, campus, and WAN environments.

ATB
See All trunks busy (ATB).

ATD
See Attention dial (ATD).

attendant
A person at a console who provides personalized service for incoming callers and voice-services users by performing switching and signaling operations. See also attendant console.

ATM
See asynchronous Transfer Mode (ATM).

attendant console
The workstation used by an attendant. The attendant console allows the attendant to originate a call, answer an incoming call, transfer a call to another extension or trunk, put a call on hold, and remove a call from hold. Attendants using the console can also manage and monitor some system operations. Also called console. See also attendant.

Attention dial (ATD)
A command in the Hayes modem command set for asynchronous modems.

Audio Information Exchange (AUDIX)
A fully integrated voice-mail system. Can be used with a variety of communications systems to provide call-history data, such as subscriber identification and reason for redirection.

AUDIX
See Audio Information Exchange (AUDIX).

auto-in trunk group
Trunk group for which the CO processes all of the digits for an incoming call. When a CO seizes a trunk from an auto-in trunk group, the switch automatically connects the trunk to the destination — typically an ACD split where, if no agents are available, the call goes into a queue in which callers are answered in the order in which they arrive.

Auto-In Work mode
One of four agent work modes: the mode in which an agent is ready to process another call as soon as the current call is completed.

Automatic Alternate Routing (AAR)
A feature that routes calls to other than the first-choice route when facilities are unavailable.***

Automatic Callback (ACB)
A feature that enables internal callers, upon reaching a busy extension, to have the system automatically connect and ring both parties when the called party becomes available.

Automatic Call Distribution (ACD)
A feature that answers calls, and then, depending on administered instructions, delivers messages appropriate for the caller and routes the call to an agent when one becomes available.

Automatic Call Distribution (ACD) split
A method of routing calls of a similar type among agents in a call center. Also, a group of extensions that are staffed by agents trained to handle a certain type of incoming call.

Automatic calling unit (ACU)
A device that places a telephone call.

Automatic Circuit Assurance (ACA)
A feature that tracks calls of unusual duration to facilitate troubleshooting. A high number of very short calls or a low number of very long calls may signify a faulty trunk.

Automatic Number Identification (ANI)
Representation of the calling number, for display or for further use to access information about the caller. Available with Signaling System 7.

automatic restoration
A service that restores disrupted connections between access endpoints (nonsignaling trunks) and data endpoints (devices that connect the switch to data terminal and/or communications

equipment). Restoration is done within seconds of a service disruption so that critical data applications can remain operational.

Automatic Route Selection (ARS)
A feature that allows the system to automatically choose the least-cost way to send a toll call.

automatic trunk
A trunk that does not require addressing information because the destination is predetermined. A request for service on the trunk, called a seizure, is sufficient to route the call. The normal destination of an automatic trunk is the communications-system attendant group. Also called automatic incoming trunk and automatic tie trunk.

AUX
Auxiliary

auxiliary equipment
Equipment used for optional system features, such as Loudspeaker Paging and Music-on-Hold.

auxiliary trunk
A trunk used to connect auxiliary equipment, such as radio-paging equipment, to a communications system.

Aux-Work mode
A work mode in which agents are unavailable to receive ACD calls. Agents enter Aux-Work mode when involved in non-ACD activities such as taking a break, going to lunch, or placing an outgoing call.

AVD
Alternate voice/data

AWOH
See Administration Without Hardware (AWOH).

AWG
American Wire Gauge

AWT
Average work time

B

B8ZS
Bipolar Eight Zero Substitution.

bandwidth
The difference, expressed in hertz, between the defined highest and lowest frequencies in a range.

barrier code
A security code used with the Remote Access feature to prevent unauthorized access to the system.

baud
A unit of transmission rate equal to the number of signal events per second. See also bit rate and bits per second (bps).

BCC
See Bearer capability class (BCC).

BCMS
Basic Call Management System

BCT
See business communications terminal (BCT).

Bearer capability class (BCC)
Code that identifies the type of a call (for example, voice and different types of data). Determination of BCC is based on the caller's characteristics for non-ISDN endpoints and on the Bearer Capability and Low-Layer Compatibility Information Elements of an ISDN endpoint. Current BCCs are 0 (voice-grade data and voice), 1 (DMI mode 1, 56 kbps data transmission), 2 (DMI mode 2, synchronous/asynchronous data transmission up to 19.2 kbps) 3 (DMI mode 3, 64 kbps circuit/packet data transmission), 4 (DMI mode 0, 64 kbps synchronous data), 5 (temporary signaling connection, and 6 (wideband call, 128–1984 kbps synchronous data).

BER
Bit error rate

BHCC
Busy-hour call completions

bit (binary digit)
One unit of information in binary notation, having two possible values: 0 or 1.

bits per second (bps)
The number of binary units of information that are transmitted or received per second. See also baud and **bit rate**.

bit rate
The speed at which bits are transmitted, usually expressed in bits per second. Also called data rate. See also baud and bits per second (bps).

BLF
Busy Lamp Field

BN
Billing number

BOS
Bit-oriented signaling

BPN
Billed-party number

bps
See bits per second (bps).

bridge (bridging)
The appearance of a voice terminal's extension at one or more other voice terminals.

BRI
The ISDN Basic Rate Interface specification.

bridged appearance
A call appearance on a voice terminal that matches a call appearance on another voice terminal for the duration of a call.

BTU
British Thermal Unit

buffer
1. In hardware, a circuit or component that isolates one electrical circuit from another. Typically, a buffer holds data from one circuit or process until another circuit or process is ready to accept the data.
2. In software, an area of memory that is used for temporary storage.

bus
A multiconductor electrical path used to transfer information over a common connection from any of several sources to any of several destinations.

business communications terminal (BCT)
A digital data terminal used for business applications. A BCT can function via a data module as a special-purpose terminal for services provided by a processor or as a terminal for data entry and retrieval.

BX.25
A version of the CCITT X.25 protocol for data communications. BX.25 adds a fourth level to the standard X.25 interface. This uppermost level combines levels 4, 5, and 6 of the ISO reference model.

bypass tie trunks
A 1-way, outgoing tie trunk from a tandem switch to a main switch in an ETN. Bypass tie trunks, provided in limited quantities, are used as a last-choice route when all trunks to another tandem switch are busy. Bypass tie trunks are used only if all applicable intertandem trunks are busy.

byte
A sequence of (usually eight) bits processed together.

C

CACR
Cancellation of Authorization Code Request

cabinet
Housing for racks, shelves, or carriers that hold electronic equipment.

cable
Physical connection between two pieces of equipment (for example, data terminal and modem) or between a piece of equipment and a termination field.

cable connector
A jack (female) or plug (male) on the end of a cable. A cable connector connects wires on a cable to specific leads on telephone or data equipment.

CAG
Coverage answer group

call appearance
1. For the attendant console, six buttons, labeled a–f, used to originate, receive, and hold calls. Two lights next to the button show the status of the call appearance.
2. For the voice terminal, a button labeled with an extension and used to place outgoing calls,

receive incoming calls, or hold calls. Two lights next to the button show the status of the call appearance.

call-control capabilities
Capabilities (*Third Party Selective Hold, Third Party Reconnect, Third Party Merge*) that can be used in either of the Third Party Call Control ASE (cluster) subsets (Call Control and Domain Control).

Call Detail Recording (CDR)
A feature that uses software and hardware to record call data (same as CDRU).

Call Detail Recording utility (CDRU)
Software that collects, stores, optionally filters, and outputs call-detail records.

Call Management System (CMS)
An application, running on an adjunct processor, that collects information from an ACD unit. CMS enables customers to monitor and manage telemarketing centers by generating reports on the status of agents, splits, trunks, trunk groups, vectors, and VDNs, and enables customers to partially administer the ACD feature for a communications system.

call-reference value (CRV)
An identifier present in ISDN messages that associates a related sequence of messages. In ASAI, CRVs distinguish between associations.

call vector
A set of up to 15 vector commands to be performed for an incoming or internal call.

callback call
A call that automatically returns to a voice-terminal user who activated the Automatic Callback or Ringback Queuing feature.

call-waiting ringback tone
A low-pitched tone identical to ringback tone except that the tone decreases in the last 0.2 seconds (in the United States). Call-waiting ringback tone notifies the attendant that the Attendant Call Waiting feature is activate and that the called party is aware of the waiting call. Tones in international countries may sound different.

call work code
A number, up to 16 digits, entered by ACD agents to record the occurrence of customer-defined events (such as account codes, social security numbers, or phone numbers) on ACD calls.

CAMA
Centralized Automatic Message Accounting

carrier
An enclosed shelf containing vertical slots that hold circuit packs.

carried load
The amount of traffic served by traffic-sensitive facilities during a given interval.

CARR-POW
Carrier Port and Power Unit for AC Powered Systems

CAS
Centralized Attendant Service or Call Accounting System

CCS or hundred call seconds
A unit of call traffic. Call traffic for a facility is scanned every 100 seconds. If the facility is busy, it is assumed to have been busy for the entire scan interval. There are 3600 seconds per hour. The Roman numeral for 100 is the capital letter C. The abbreviation for call seconds is CS. Therefore,

100 call seconds is abbreviated CCS. If a facility is busy for an entire hour, then it is said to have been busy for 36 CCS. See also **Erlang.**

capability
A request or indication of an operation. For example, *Third Party Make Call* is a request for setting up a call; *event report* is an indication that an event has occurred.

capability group
Set of capabilities, determined by switch administration, that can be requested by an application. Capability groups denote association types. For example, *Call Control* is a type of association that allows certain functions (the ones in the capability group) to be performed over this type of association. Also referred to as administration groups or application service elements (ASEs).

CA-TSC
Call-Associated Temporary Signaling Connection

cause value
A value is returned in response to requests or in event reports when a denial or unexpected condition occurs. ASAI cause values fall into two coding standards: Coding Standard 0 includes any cause values that are part of AT&T and CCITT ISDN specifications; Coding standard 3 includes any other ASAI cause values. This document uses a notation for cause value where the coding standard for the cause is given first, then a slash, then the cause value. Example: CS0/100 is coding standard 0, cause value 100.

CBC
Call-by-call or coupled bonding conductor

CC
Country code

CCIS
Common-Channel Interoffice Signaling

CCITT
CCITT (Comitte Consultatif International Telephonique et Telegraphique), now called *International Telecommunications Union* (ITU). See International Telecommunications Union (ITU).

CCMS
Control-Channel Message Set

CCS
See CCS or hundred call seconds.

CCSA
Common-Control Switching Arrangement

CDM
Channel-division multiplexing

CDOS
Customer-dialed and operator serviced

CDR
See Call Detail Recording (CDR).

CDRP
Call Detail Record Poller

CDRR
Call Detail Recording and Reporting

CDRU
See Call Detail Recording utility (CDRU).

CEM
Channel-expansion multiplexing

center-stage switch (CSS)
The central interface between the processor port network and expansion port networks in a CSS-connected system.

central office (CO)
The location housing telephone switching equipment that provides local telephone service and access to toll facilities for long-distance calling.

central office (CO) codes
The first three digits of a 7-digit public-network telephone number in the United States.

central office (CO) trunk
A telecommunications channel that provides access from the system to the public network through the local CO.

CEPT1
European Conference of Postal and Telecommunications Rate 1

channel
1. A circuit-switched call.
2. A communications path for transmitting voice and data.
3. In wideband, all of the time slots (contiguous or noncontiguous) necessary to support a call. Example: an H0-channel uses six 64-kbps time slots.
4. A DS0 on a T1 or E1 facility not specifically associated with a logical circuit-switched call; analogous to a single trunk.

channel negotiation
The process by which the channel offered in the Channel Identification Information Element (CIIE) in the SETUP message is negotiated to be another channel acceptable to the switch that receives the SETUP message and ultimately to the switch that sent the SETUP. Negotiation is attempted only if the CIIE is encoded as *Preferred*. Channel negotiation is not attempted for wideband calls.

CI
Clock input

circuit
1. An arrangement of electrical elements through which electric current flows.
2. A channel or transmission path between two or more points.

circuit pack
A card on which electrical circuits are printed, and IC chips and electrical components are installed. A circuit pack is installed in a switch carrier.

CISPR
International Special Committee on Radio Interference

Class of Restriction (COR)
A feature that allows up to 64 classes of call-origination and call-termination restrictions for voice terminals, voice-terminal groups, data modules, and trunk groups. See also Class of Service (COS).

Class of Service (COS)
A feature that uses a number to specify if voice-terminal users can activate the Automatic Callback, Call Forwarding All Calls, Data Privacy, or Priority Calling features. See also Class of Restriction (COR).

cm
Centimeter

CM
Connection Manager

CMDR
Centralized Message Detail Recording

CMS
Call Management System

CO
See central office (CO).

common-control switching arrangement (CCSA)
A private telecommunications network using dedicated trunks and a shared switching center for interconnecting company locations.

communications system
The software-controlled processor complex that interprets dialing pulses, tones, and keyboard characters and makes the proper connections both within the system and external to the system. The communications system itself consists of a digital computer, software, storage device, and carriers with special hardware to perform the connections. A communications system provides voice and data communications services, including access to public and private networks, for telephones and data terminals on a customer's premises. See also switch.

confirmation tone
A tone confirming that feature activation, deactivation, or cancellation has been accepted.

connectivity
The connection of disparate devices within a single system.

console
See attendant console.

contiguous
Adjacent DS0s within one T1 or E1 facility or adjacent TDM or fiber time slots. The first and last TDM bus, DS0, or fiber time slots are not considered contiguous (no wraparound). For an E1 facility with a D-channel, DS0s 15 and 17 are considered contiguous.

control cabinet
See control carrier.

control carrier
A carrier in a multicarrier cabinet that contains the SPE circuit packs and, unlike an R5r control carrier, port circuit packs. Also called control cabinet in a single-carrier cabinet. See also switch-processing element (SPE).

controlled station
A station that is monitored and controlled via a domain-control association.

COR
See Class of Restriction (COR).

COS
See Class of Service (COS).

coverage answer group
A group of up to eight voice terminals that ring simultaneously when a call is redirected to it by Call Coverage. Any one of the group can answer the call.

coverage call
A call that is automatically redirected from the called party's extension to an alternate answering position when certain coverage criteria are met.

coverage path
The order in which calls are redirected to alternate answering positions.

coverage point
An extension or attendant group, VDN, or ACD split designated as an alternate answering position in a coverage path.

covering user
A person at a coverage point who answers a redirected call.

CP
Circuit pack

CPE
Customer-premises equipment

CPN
Called-party number

CPN/BN
Calling-party number/billing number

CPTR
Call-progress-tone receiver

CRC
Cyclical Redundancy Checking

critical-reliability system
A system that has the following duplicated items: control carriers, tone clocks, EI circuit packs, and cabling between port networks and center-stage switch in a CSS-connected system. See also duplicated common control, and duplication.

CSA
Canadian Safety Association

CSCC
Compact single-carrier cabinet

CSCN
Center-stage control network

CSD
Customer-service document

CSM
Centralized System Management

CSS
See center-stage switch (CSS).

CSSO
Customer Services Support Organization

CSU
Channel service unit

CTS
Clear to Send

CWC
See call work code.

D

DAC
1. Dial access code or Direct Agent Calling
2. See digital-to-analog converter (DAC).

data channel
A communications path between two points used to transmit digital signals.

data-communications equipment (DCE)
The equipment (usually a modem, data module, or packet assembler/disassembler) on the network side of a communications link that makes the binary serial data from the source or transmitter compatible with the communications channel.

data link
The configuration of physical facilities enabling end terminals to communicate directly with each other.

data module
An interconnection device between a BRI or DCP interface of the switch and data terminal equipment or data communications equipment.

data path
The end-to-end connection used for a data communications link. A data path is the combination of all elements of an interprocessor communication in a DCS.

data port
A point of access to a computer that uses trunks or lines for transmitting or receiving data.

data rate
See bit rate.

data service unit (DSU)
A device that transmits digital data on transmission facilities.

data terminal
An input/output (I/O) device that has either switched or direct access to a host computer or to a processor interface.

data terminal equipment (DTE)
Equipment consisting of the endpoints in a connection over a data circuit. In a connection between a data terminal and host, the terminal, the host, and their associated modems or data modules make up the DTE.

dB
Decibel

dBA
Decibels in reference to amperes.

dBrnC
Decibels above reference noise with C filter.

DC
Direct current

DCE
Data-communications equipment

D-channel backup
Type of backup used with Non-Facility Associated Signaling (NFAS). A primary D-channel provides signaling for an NFAS D-channel group (two or more PRI facilities). A second D-channel, on a separate PRI facility of the NFAS D-channel group, is designated as backup for the D-channel. Failure of the primary D-channel causes automatic transfer of call-control signaling to the backup D-channel. The backup becomes the primary D-channel. When the failed channel returns to service, it becomes the backup D-channel.

DCO
Digital central office

DCP
Digital Communications Protocol

DCS
Distributed Communications System

DDC
Direct Department Calling

DDD
Direct Distance Dialing

delay-dial trunk
A trunk that allows dialing directly into a communications system (digits are received as they are dialed).

denying a request
Sending a negative acknowledgement (NAK), done by sending an FIE with a *return error* component (and a cause value). It should not be confused with the denial event report that applies to calls.

designated voice terminal
The specific voice terminal to which calls, originally directed to a certain extension, are redirected. Commonly used to mean the forwarded-to terminal when Call Forwarding All Calls is active.

dial-repeating trunks
A PBX tie trunk that is capable of handling PBX station-signaling information without attendant assistance.

dial-repeating tie trunk
A tie trunk that transmits called-party addressing information between two communications systems.

DID
Direct Inward Dialing

digit conversion
A process used to convert specific dialed numbers into other dialed numbers.

digital
The representation of information by discrete steps. See also analog.

digital communications protocol (DCP)
A proprietary protocol used to transmit both digitized voice and digitized data over the same communications link. A DCP link is made up of two 64-kbps information (I-) channels and one 8-kbps signaling (S-) channel.

digital data endpoints
In DEFINITY ECS, devices such as the 510D terminal or the 515-type business communications terminal (BCT).

digital multiplexed interface (DMI)
An interface that provides connectivity between a communications system and a host computer or between two communications systems using DS1 24th-channel signaling. DMI provides 23 64-kbps data channels and 1 common-signaling channel over a twisted-pair connection. DMI is offered through two capabilities: bit-oriented signaling (DMI-BOS) and message-oriented signaling (DMI-MOS).

digital signal level 0 (DS0)
A single 64-kbps voice channel. A DS0 is a single 64-kbps channel in a T1 or E1 facility and consists of eight bits in a T1 or E1 frame every 125 microseconds.

digital signal level 1 (DS1)
A single 1.544-Mbps (United States) or 2.048-Mbps (outside the United States) digital signal carried on a T1 transmission facility. A DS1 converter complex consists of a pair, one at each end, of DS1 converter circuit packs and the associated T1/E1 facilities.

digital terminal data module (DTDM)
An integrated or adjunct data module that shares with a digital telephone the same physical port for connection to a communications system. The function of a DTDM is similar to that of a PDM and MPDM in that it converts RS-232C signals to DCP signals.

digital-to-analog converter (DAC)
A device that converts data in digital form to the corresponding analog signals. See also analog-to-digital converter (ADC).

digital transmission
A mode of transmission in which information to be transmitted is first converted to digital form and then transmitted as a serial stream of pulses.

digital trunk
A circuit that carries digital voice and/or digital data in a telecommunications channel.

DIOD
Direct Inward and Outward Dialing

direct agent
A feature, accessed only via ASAI, that allows a call to be placed in a split queue but routed only to a specific agent in that split. The call receives normal ACD call treatment (for example, announcements) and is measured as an ACD call while ensuring that a particular agent answers.

Direct Extension Selection (DXS)
A feature on an attendant console that allows an attendant direct access to voice terminals by pressing a group-select button and a DXS button.

Direct Inward Dialing (DID)
A feature that allows an incoming call from the public network (not FX or WATS) to reach a specific telephone without attendant assistance.

Direct Inward Dialing (DID) trunk
An incoming trunk used for dialing directly from the public network into a communications system without help from the attendant.

disk drive
An electromechanical device that stores data on and retrieves data from one or more disks.

distributed communications system (DCS)
A network configuration linking two or more communications systems in such a way that selected features appear to operate as if the network were one system.

DIVA
Data In/Voice Answer

DLC
Data line circuit

DLDM
Data-line data module

DMI
Digital-multiplexed interface

DND
Do not disturb

DNIS
Dialed-Number Identification Service

DOD
Direct Outward Dialing

domain
VDNs, ACD splits, and stations. The VDN domain is used for active-notification associations. The ACD-split domain is for active-notification associations and domain-control associations. The station domain is used for the domain-control associations.

domain-control association
A *Third Party Domain Control Request* capability initiates a unique CRV/link number combination, which is referred to as a domain-control association.

domain-controlled split
A split for which *Third Party Domain Control* request has been accepted. A domain-controlled split provides an event report for logout.

domain-controlled station
A station for which a *Third_Party_Domain_Control* request has been accepted. A domain-controlled station provides event reports for calls that are alerting, connected, or held at the station.

domain-controlled station on a call
A station that is active on a call, and which provides event reports over one or two domain-control associations.

DOSS
Delivery Operations Support System

DOT
Duplication Option Terminal

DPM
Dial Plan Manager

DPR
Dual-port RAM

DS1
Digital Signal Level 1

DS1C
Digital Signal Level-1 protocol C

DS1 CONV
Digital Signal Level-1 converter

DSI
Digital signal interface

DSU
Data service unit

DTDM
Digital-terminal data module

DTE
Data-terminal equipment

DTGS
Direct Trunk Group Select

DTMF
Dual-tone multifrequency

DTS
Disk-tape system

duplicated common control
Two processors ensuring continuous operation of a communications system. While one processor is online, the other functions as a backup. The backup processor goes online periodically or when a problem occurs.

duplication
The use of redundant components to improve availability. When a duplicated subsystem fails, its backup redundant system automatically takes over.

duplication option
A system option that duplicates the following: control carrier containing the SPE, EI circuit packs in carriers, fiber-optic cabling between port networks, and center-stage switch in a CSS-connected system.

DWBS
DEFINITY Wireless Business System

DXS
Direct extension selection

E

E1
A digital transmission standard that carries traffic at 2.048 Mbps. The E1 facility is divided into 32 channels (DS0s) of 64 kbps information. Channel 0 is reserved for framing and synchronization information. A D-channel occupies channel 16.

E & M
Ear and mouth (receive and transmit)

EA
Expansion archangel

EAL
Expansion archangel link

ear and mouth (E & M) signaling
Trunk supervisory signaling, used between two communications systems, whereby signaling information is transferred through 2-state voltage conditions (on the E and M leads) for analog applications and through a single bit for digital applications.

EBCDIC
Extended Binary-Coded Decimal Interexchange Code

ECC
Error Correct Code

ECMA
European Computer Manufacturers Association

EFP
Electronic power feed

EI
Expansion interface

EIA
Electronic Industries Association

EIA-232
A physical interface specified by the EIA. EIA-232 transmits and receives asynchronous data at speeds of up to 19.2 kbps over cable distances of up to 50 feet. EIA-232 replaces RS-232 protocol in some DEFINITY applications.

electronic tandem network (ETN)
A tandem tie-trunk network that has automatic call-routing capabilities based on the number dialed and the most preferred route available. Each switch in the network is assigned a unique private network office code (RNX), and each voice terminal is assigned a unique extension.

Electronics Industries Association (EIA)
A trade association of the electronics industry that establishes electrical and functional standards.

emergency transfer
If a major system failure occurs, automatic transfer is initiated to a group of telephones capable of making outgoing calls. The system operates in this mode until the failure is repaired and the system automatically returns to normal operation. Also called power-failure transfer.

EMI
Electromagnetic interference

end-to-end signaling
The transmission of touch-tone signals generated by dialing from a voice terminal to remote computer equipment. These digits are sent over the trunk as DTMF digits whether the trunk signaling type is marked as tone or rotary and whether the originating station is tone or rotary. Example: a call to a voice-mail machine or automated-attendant service. A connection is first established over an outgoing trunk. Then additional digits are dialed to transmit information to be processed by the computer equipment.

enhanced private-switched communications service (EPSCS)
An analog private telecommunications network based on the No. 5 crossbar and 1A ESS that provides advanced voice and data telecommunications services to companies with many locations.

EPN
Expansion-port network

EPROM
Erasable programmable read-only memory

EPSCS
Enhanced Private Switched Communications Services

ERL
Echo return loss

Erlang
A unit of traffic intensity, or load, used to express the amount of traffic needed to keep one facility busy for one hour. One Erlang is equal to 36 CCS. See also CCS or hundred call seconds.

ESF
Extended superframe format

ESPA
European Standard Paging Access

ETA
Extended Trunk Access; also Enhanced Terminal Administration

ETN
Electronic tandem network

ETSI
European Telecommunications Standards Institute

expansion archangel (EAA)
A network-control microprocessor located on an expansion interface (EI) port circuit pack in an expansion port network. The EA provides an interface between the EPN and its controlling switch-processing element.

expansion-archangel link (EAL)
A link-access function on the D-channel (LAPD) logical link that exists between a switch-processing element and an expansion archangel (EA). The EAL carries control messages from the SPE to the EA and to port circuit packs in an expansion port network.

expansion control cabinet
See expansion control carrier.

expansion control carrier
A carrier in a multicarrier cabinet that contains extra port circuit packs and a maintenance interface. Also called expansion control cabinet in a single-carrier cabinet.

expansion interface (EI)
A port circuit pack in a port network that provides the interface between a PN's TDM bus/ packet bus and a fiber-optic link. The EI carries circuit-switched data, packet-switched data, network control, timing control, and DS1 control. In addition, an EI in an expansion port network communicates with the master maintenance circuit pack to provide the EPN's environmental and alarm status to the switch-processing element.

expansion port network (EPN)
A port network (PN) that is connected to the TDM bus and packet bus of a processor port network (PPN). Control is achieved by indirect connection of the EPN to the PPN via a port-network link (PNL). See also port network (PN).

extension-in
Extension-In (ExtIn) is the work state agents go into when they answer (receive) a non-ACD call. If the agent is in Manual-In or Auto-In and receives an extension-in call, it is recorded by CMS as an AUX-In call.

extension-out
The work state that agents go into when they place (originate) a non-ACD call.

external measurements
Those ACD measurements that are made by the External CMS adjunct.

extension
A 1- to 5-digit number by which calls are routed through a communications system or, with a Uniform Dial Plan (UDP) or main-satellite dialing plan, through a private network.

external call
A connection between a communications system user and a party on the public network or on another communications system in a private network.

F

FAC
Feature Access Code

facility
A telecommunications transmission pathway and associated equipment.

facility-associated signaling (FAS)
Signaling for which a D-channel carries signaling only for those channels on the same physical interface.

FAS
Facility-associated signaling

FAT
Facility access trunk

FAX
Facsimile

FCC
Federal Communications Commission

FEAC
Forced Entry of Account Codes

feature
A specifically defined function or service provided by the system.

feature button
A labeled button on a telephone or attendant console used to access a specific feature.

FEP
Front-end processor

FIC
Facility interface codes

fiber optics
A technology using materials that transmit ultrawideband electromagnetic light-frequency ranges for high-capacity carrier systems.

fixed
A trunk allocation term. In the fixed allocation scheme, the time slots necessary to support a wideband call are contiguous, and the first time slot is constrained to certain starting points.

flexible
A trunk allocation term. In the flexible allocation scheme, the time slots of a wideband call can occupy noncontiguous positions within a single T1 or E1 facility.

floating
A trunk allocation term. In the floating allocation scheme, the time slots of a wideband call are contiguous, but the position of the first time slot is not fixed.

FNPA
Foreign Numbering-Plan Area

foreign-exchange (FX)
A CO other than the one providing local access to the public telephone network.

foreign-exchange trunk
A telecommunications channel that directly connects the system to a CO other than its local CO.

foreign numbering-plan area code (FNPAC)
An area code other than the local area code, that must be dialed to call outside the local geographical area.

FRL
Facilities Restriction Level

FX
Foreign exchange

G

G3-MA
Generic 3 Management Applications

G3-MT
Generic 3 Management Terminal

G3r
Generic 3, RISC (Reduced Instruction Set Computer)

generalized route selection (GRS)
An enhancement to Automatic Alternate Routing/Automatic Route Selection (AAR/ARS) that performs routing based on call attributes, such as Bearer Capability Classes (BCCs), in addition to the address and facilities restriction level (FRL), thus facilitating a Uniform Dial Plan (UDP) that is independent of the type of call being placed.

glare
The simultaneous seizure of a 2-way trunk by two communications systems, resulting in a standoff.

GM
Group manager

GPTR
General-purpose tone receiver

grade of service
The number of call attempts that fail to receive service immediately. Grade of service is also expressed as the quantity of all calls that are blocked or delayed.

ground-start trunk
A trunk on which, for outgoing calls, the system transmits a request for services to a distant switching system by grounding the trunk ring lead. To receive the digits of the called number, that system grounds the trunk tip lead. When the system detects this ground, the digits are sent.

GRS
Generalized Route Selection

H

H0
An ISDN information transfer rate for 384-kbps data defined by CCITT and ANSI standards.

H11
An ISDN information transfer rate for 1536-kbps data defined by CCITT and ANSI standards.

H12
An ISDN information transfer rate for 1920-kbps data defined by CCITT and ANSI standards.

handshaking logic
A format used to initiate a data connection between two data module devices.

hertz (Hz)
A unit of frequency equal to one cycle per second.

high-reliability system
A system having the following: two control carriers, duplicate expansion interface (EI) circuit packs in the PPN (in R5r with CSS), and duplicate switch node clock circuit packs in the switch node (SN) carriers. See also duplicated common control, duplication, duplication option, and critical-reliability system.

HNPA
See home numbering-plan area code (HNPA).

holding time
The total length of time in minutes and seconds that a facility is used during a call.

home numbering-plan area code (HNPA)
The local area code. The area code does not have to be dialed to call numbers within the local geographical area.

hop
Nondirect communication between two switch communications interfaces (SCI) where the SCI message passes automatically without intermediate processing through one or more intermediate SCIs.

host computer
A computer, connected to a network, that processes data from data-entry devices.

hunt group
A group of extensions that are assigned the Station Hunting feature so that a call to a busy extension reroutes to an idle extension in the group. See also ACD work mode.

Hz
See hertz (Hz).

I

I1
The first information channel of DCP.

I2
The second information channel of DCP.

I2 Interface
A proprietary interface used for the DEFINITY Wireless Business System for the radio-controller circuit packs. Each interface provides communication between the radio-controller circuit pack and up to two wireless fixed bases.

I3 Interface
A proprietary interface used for the DEFINITY Wireless Business System for the cell antenna units. Each wireless fixed base can communicate to up to four cell antenna units.

IAS
Inter-PBX Attendant Service

ICC
Intercabinet cable or intercarrier cable

ICD
Inbound Call Director

ICDOS
International Customer-Dialed Operator Service

ICHT
Incoming call-handling table

ICI
Incoming call identifier

ICM
Inbound Call Management

IDDD
International Direct Distance Dialing

IDF
Intermediate distribution frame

IE
Information element

immediate-start tie trunk
A trunk on which, after making a connection with a distant switching system for an outgoing call, the system waits a nominal 65 ms before sending the digits of the called number. This allows time for the distant system to prepare to receive digits. On an incoming call, the system has less than 65 ms to prepare to receive the digits.

IMT
Intermachine trunk

in
Inch

INADS
Initialization and Administration System

incoming gateway
A PBX that routes an incoming call on a trunk *not* administered for Supplementary Services Protocol B to a trunk *not* administered for Supplementary Services Protocol B.

information exchange
The exchange of data between users of two different systems, such as the switch and a host computer, over a LAN.

Information Systems Network (ISN)
A WAN and LAN with an open architecture combining host computers, minicomputers, word processors, storage devices, PCs, high-speed printers, and nonintelligent terminals into a single packet-switching system.

INS
ISDN Network Service

inside call
A call placed from one telephone to another within the local communications system.

Integrated Services Digital Network (ISDN)
A public or private network that provides end-to-end digital communications for all services to which users have access by a limited set of standard multipurpose user-network interfaces defined by the CCITT. Through internationally accepted standard interfaces, ISDN provides digital circuit-switched or packet-switched communications within the network and links to other ISDNs to provide national and international digital communications. See also Integrated Services Digital Network Basic Rate Interface (ISDN-BRI) and Integrated Services Digital Network Primary Rate Interface (ISDN-PRI).

Integrated Services Digital Network Basic Rate Interface (ISDN-BRI)
The interface between a communications system and terminal that includes two 64-kbps B-channels for transmitting voice or data and one 16-kbps D-channel for transmitting associated B-channel call control and out-of-band signaling information. ISDN-BRI also includes 48 kbps for transmitting framing and D-channel contention information, for a total interface speed of 192 kbps. ISDN-BRI serves ISDN terminals and digital terminals fitted with ISDN terminal adapters. See also Integrated Services Digital Network (ISDN) andIntegrated Services Digital Network Primary Rate Interface (ISDN-PRI).

Integrated Services Digital Network Primary Rate Interface (ISDN-PRI)
The interface between multiple communications systems that in North America includes 24 64-kbps channels, corresponding to the North American digital signal level-1 (DS1) standard rate of 1.544 Mbps. The most common arrangement of channels in ISDN-PRI is 23 64-kbps B-channels for transmitting voice and data and 1 64-kbps D-channel for transmitting associated B-channel call control and out-of-band signaling information. With nonfacility-associated signaling (NFAS), ISDN-PRI can include 24 B-channels and no D-channel. See alsoIntegrated Services Digital Network (ISDN) andIntegrated Services Digital Network Basic Rate Interface (ISDN-BRI).

intercept tone
A tone that indicates a dialing error or denial of the service requested.

interface
A common boundary between two systems or pieces of equipment.

internal call
A connection between two users within a system.

International Telecommunications Union (ITU)
Formerly known as International Telegraph and Telephone Consultative Committee (CCITT), ITU is an international organization that sets universal standards for data communications, including ISDN. ITU members are from telecommunications companies and organizations around the world. See alsoBX.25.

International Telegraph and Telephone Consultative Committee
See International Telecommunications Union (ITU).

interflow
The ability for calls to forward to other splits on the same PBX or a different PBX using the Call Forward All Calls feature.

intraflow
The ability for calls to redirect to other splits on the same PBX on a conditional or unconditional basis using call coverage busy, don't answer, or all criteria.

internal measurements
BCMS measurements that are made by the system. ACD measurements that are made external to the system (via External CMS) are referred to as external measurements.

in-use lamp
A red light on a multiappearance voice terminal that lights to show which call appearance will be selected when the handset is lifted or which call appearance is active when a user is off-hook.

INWATS
Inward Wide Area Telephone Service

IO
Information outlet

ISDN
See Integrated Services Digital Network (ISDN).

ISDN Gateway (IG)
A feature allowing integration of the switch and a host-based telemarketing application via a link to a gateway adjunct. The gateway adjunct is a 3B-based product that notifies the host-based telemarketing application of call events.

ISDN trunk
A trunk administered for use with ISDN-PRI. Also called ISDN facility.

ISDN-PRI terminal adapter
An interface between endpoint applications and an ISDN PRI facility. ISDN-PRI terminal adapters are currently available from other vendors and are primarily designed for video conferencing applications. Accordingly, currently available terminal adapters adapt the two pairs of video codec data (V.35) and dialing (RS-366) ports to an ISDN PRI facility.

IS/DTT
Integrated Services/digital tie trunk

ISN
Information Systems Network

ISO
International Standards Organization

ISV
Independent software vendor

ITP
Installation test procedure

ITU
International Telecommunications Union

IXC
Interexchange carrier code

K

kHz
Kilohertz

kbps
Kilobits per second

kbyte
Kilobyte

kg
Kilogram

L

LAN
Local area network

LAP-D
Link Access Procedure on the D-channel

LAPD
Link Access Procedure data

LATA
Local access and transport area

lb
Pound

LBO
Line buildout

LDN
Listed directory number

LDS
Long-distance service

LEC
Local exchange carrier

LED
See light-emitting diode (LED).

light-emitting diode (LED)
A semiconductor device that produces light when voltage is applied. LEDs provide a visual indication of the operational status of hardware components, the results of maintenance tests, the alarm status of circuit packs, and the activation of telephone features.

lightwave transceiver
Hardware that provides an interface to fiber-optic cable from port circuit packs and DS1 converter circuit packs. Lightwave transceivers convert electrical signals to light signals and vice versa.

line
A transmission path between a communications system or CO switching system and a voice terminal or other terminal.

line appearance
See appearance.

line buildout
A selectable output attenuation is generally required of DTE equipment because T1 circuits require the last span to lose 15–22.5 dB.

line port
Hardware that provides the access point to a communications system for each circuit associated with a telephone or data terminal.

link
A transmitter-receiver channel that connects two systems.

link-access procedure on the D-channel (LAPD)
A link-layer protocol on the ISDN-BRI and ISDN-PRI data-link layer (level 2). LAPD provides data transfer between two devices, and error and flow control on multiple logical links. LAPD is used for signaling and low-speed packet data (X.25 and mode 3) on the signaling (D-) channel and for mode-3 data communications on a bearer (B-) channel.

LINL
Local indirect neighbor link

local area network (LAN)
A networking arrangement designed for a limited geographical area. Generally, a LAN is limited in range to a maximum of 6.2 miles and provides high-speed carrier service with low error rates. Common configurations include daisy chain, star (including circuit-switched), ring, and bus.

logical link
The communications path between a processor and a BRI terminal.

loop-start trunk
A trunk on which, after establishing a connection with a distant switching system for an outgoing call, the system waits for a signal on the loop formed by the trunk leads before sending the digits of the called number.

LSU
Local storage unit

LWC
Leave Word Calling

M

MAC
Medium access

MADU
Modular asynchronous data unit

main distribution frame (MDF)
A device that mounts to the wall inside the system equipment room. The MDF provides a connection point from outside telephone lines to the PBX switch and to the inside telephone stations.

main-satellite-tributary
A private network configuration that can either stand alone or access an ETN. A main switch provides interconnection, via tie trunks, with one or more subtending switches, called satellites; all attendant positions for the main/satellite configuration; and access to and from the public network. To a user outside the complex, a main/satellite configuration appears as one switch, with

one listed directory number (LDN). A tributary switch is connected to the main switch via tie trunks, but has its own attendant positions and LDN.

maintenance
Activities involved in keeping a telecommunications system in proper working condition: the detection and isolation of software and hardware faults, and automatic and manual recovery from these faults.

management terminal
The terminal that is used by the system administrator to administer the switch. The terminal may also be used to access the BCMS feature.

major alarm
An indication of a failure that has caused critical degradation of service and requires immediate attention. Major alarms are automatically displayed on LEDs on the attendant console and maintenance or alarming circuit pack, logged to the alarm log, and reported to a remote maintenance facility, if applicable.

Manual-In work mode
One of four agent work modes: the mode in which an agent is ready to process another call manually. *See* Auto-In Work mode for a contrast.

MAP
Maintenance action process

MAPD
Multiapplication platform for DEFINITY

MA-UUI
Message-Associated User-to-User Signaling

Mbps
Megabits per second

M-Bus
Memory bus

Mbyte
Megabyte

MCC
Multicarrier cabinet

MCS
Message Center Service

MCT
Malicious Call Trace

MCU
Multipoint control unit

MDF
Main distribution frame

MDM
Modular data module

MDR
Message detail record

MEM
Memory

memory
A device into which information can be copied and held, and from which information can later be obtained.

memory shadowing link
An operating-system condition that provides a method for memory-resident programs to be more quickly accessed, allowing a system to reboot faster.

message center
An answering service that supplies agents to and stores messages for later retrieval.

message center agent
A member of a message-center hunt group who takes and retrieves messages for voice-terminal users.

MET
Multibutton electronic telephone

MF
Multifrequency

MFB
Multifunction board

MFC signaling
Multifrequency-compelled signaling

MHz
Megahertz

MIM
Management information message

minor alarm
An indication of a failure that could affect customer service. Minor alarms are automatically displayed on LEDs on the attendant console and maintenance or alarming circuit pack, sent to the alarm log, and reported to a remote maintenance facility, if applicable.

MIPS
Million instructions per second

MIS
Management information system

MISCID
Miscellaneous identification

MMCS
Multimedia Call Server

MMCH
Multimedia call handling

MMI
Multimedia interface

MMS
Material Management Services

MO
Maintenance object

modem
A device that converts digital data signals to analog signals for transmission over telephone circuits. The analog signals are converted back to the original digital data signals by another modem at the other end of the circuit.

modem pooling
A capability that provides shared conversion resources (modems and data modules) for cost-effective access to analog facilities by data terminals. When needed, modem pooling inserts a conversion resource into the path of a data call. Modem pooling serves both outgoing and incoming calls.

modular processor data module (MPDM)
A processor data module (PDM) that can be configured to provide several kinds of interfaces (RS-232C, RS-449, and V.35) to customer-provided data terminal equipment (DTE). See also processor data module (PDM).

modular trunk data module (MTDM)
A trunk data module that can be configured to provide several kinds of interfaces (RS-232, RS-449, and V.35) to customer-provided data terminal equipment.

modulator-demodulator
See modem.

monitored call
See active-notification call.

MOS
Message-oriented signaling

MPDM
Modular processor data module

MS
Message server

ms
Millisecond

MS/T
Main satellite/tributary

MSA
Message servicing adjunct

MSG
Message service

MSL
Material stocking location

MSM
Modular System Management

MSS
Mass storage system

MSSNET
Mass storage/network control

MT
Management terminal

MTDM
Modular trunk data module

MTP
Maintenance tape processor

MTT
Multitasking terminal

multiappearance voice terminal
A terminal equipped with several call-appearance buttons for the same extension, allowing the user to handle more than one call on that same extension at the same time.

Multicarrier cabinet
A structure that holds one to five carriers. See also single-carrier cabinet.

Multifrequency Compelled (MFC) Release 2 (R2) signaling
A signal consisting of two frequency components, such that when a signal is transmitted from a switch, another signal acknowledging the transmitted signal is received by the switch. R2 designates signaling used in the United States and in countries outside the United States.

multiplexer
A device used to combine a number of individual channels into a single common bit stream for transmission.

multiplexing
A process whereby a transmission facility is divided into two or more channels, either by splitting the frequency band into a number of narrower bands or by dividing the transmission channel into successive time slots. See also time-division multiplexing (TDM).

multirate
The new N x DS0 service (see N x DS0).

MWL
Message-waiting lamp

N

N+1
Method of determining redundant backup requirements. Example: if four rectifier modules are required for a DC-powered single-carrier cabinet, a fifth rectifier module is installed for backup.

N x DS0
N x DS0, equivalently referred to as N x 64 kbps, is an emerging standard for wideband calls separate from H0, H11, and H12 ISDN channels. The emerging N x DS0 ISDN multirate circuit mode bearer service will provide circuit-switched calls with data-rate multiples of 64 kbps up to 1536 kbps on a T1 facility or up to 1920 kbps on an E1 facility. In the switch, N x DS0 channels will range up to 1984 kbps using NFAS E1 interfaces.

NANP
North American Numbering Plan

narrowband
A circuit-switched call at a data rate up to and including 64 kbps. All nonwideband switch calls are considered narrowband.

native terminal support
A predefined terminal type exists in switch software, eliminating the need to alias the terminal (that is, manually map call appearances and feature buttons onto some other natively supported terminal type).

NAU
Network access unit

NCA/TSC
Noncall-associated/temporary-signaling connection

NCOSS
Network Control Operations Support Center

NCSO
National Customer Support Organization

NEC
National Engineering Center

NEMA
National Electrical Manufacturer's Association

NETCON
Network-control circuit pack

network
A series of points, nodes, or stations connected by communications channels.

network-specific facility (NSF)
An information element in an ISDN-PRI message that specifies which public-network service is used. NSF applies only when Call-by-Call Service Selection is used to access a public-network service.

network interface
A common boundary between two systems in an interconnected group of systems.

NFAS
See Nonfacility-associated signaling (NFAS).

NI
Network interface

NID
Network Inward Dialing

NM
Network management

NN
National number

node
A switching or control point for a network. Nodes are either tandem (they receive signals and pass them on) or terminal (they originate or terminate a transmission path).

Nonfacility-associated signaling (NFAS)
A method that allows multiple T1 and/or E1 facilities to share a single D-channel to form an ISDN-PRI. If D-channel backup is not used, one facility is configured with a D-channel, and the other facilities that share the D-channel are configured without D-channels. If D-channel backup is used, two facilities are configured to have D-channels (one D-channel on each facility), and the other facilities that share the D-channels are configured without D-channels.

NPA
Numbering-plan area

NPE
Network processing element

NQC
Number of queued calls

NSE
Night-service extension

NSU
Network sharing unit

null modem cable
Special wiring of an RS-232-C cable such that a computer can talk to another computer (or to a printer) without a modem.

NXX
Public-network office code

O

OA
Operator assisted

occurrence
See appearance.

OCM
Outbound Call Management

offered load
The traffic that would be generated by all the requests for service occurring within a monitored interval, usually one hour.

ONS
On-premises station

OPS
Off-premises station

OPX
Off-premises extension

OQT
Oldest queued time

OSHA
Occupational Safety and Health Act

OSI
Open Systems Interconnect

OSS
Operations Support System

OSSI
Operational Support System Interface

OTDR
Optical time-domain reflectometer

othersplit
The work state that indicates that an agent is currently active on another split's call, or in ACW for another split.

OTQ
Outgoing trunk queuing

outgoing gateway
A PBX that routes an incoming call on a trunk administered for Supplementary Services Protocol B to a trunk *not* administered for Supplementary Services Protocol B.

P

PACCON
Packet control

packet
A group of bits (including a message element, which is the data, and a control information element (IE), which is the header) used in packet switching and transmitted as a discrete unit. In each packet, the message element and control IE are arranged in a specified format. See also **packet bus** and **packet switching**.

packet bus
A wide-bandwidth bus that transmits packets.

packet switching
A data-transmission technique whereby user information is segmented and routed in discrete data envelopes called packets, each with its own appended control information, for routing, sequencing, and error checking. Packet switching allows a channel to be occupied only during the transmission of a packet. On completion of the transmission, the channel is made available for the transfer of other packets. See also BX.25and **packet**.

PAD
Packet assembly/disassembly

paging trunk
A telecommunications channel used to access an amplifier for loudspeaker paging.

party/extension active on call
A party is on the call if he or she is actually connected to the call (in active talk or in held state). An originator of a call is always a party on the call. Alerting parties, busy parties, and tones are not parties on the call.

PBX
Private branch exchange

PC
See personal computer (PC).

PCM
See pulse-code modulation (PCM).

PCOL
Personal central-office line

PCOLG
Personal central-office line group

PCS
Permanent switched calls

PDM
See processor data module (PDM).

PDS
Premises Distribution System

PE
Processing element

PEC
Price element code

PEI
Processor element interchange

personal computer (PC)
A personally controllable microcomputer.

PGATE
Packet gateway

PGN
Partitioned group number

PI
Processor interface

PIB
Processor interface board

pickup group
A group of individuals authorized to answer any call directed to an extension within the group.

PIDB
Product image database

PKTINT
Packet interface

PL
Private line

PLS
Premises Lightwave System

PMS
Property Management System

PN
Port network

PNA
Private network access

POE
Processor occupancy evaluation

POP
Point of presence

port
A data- or voice-transmission access point on a device that is used for communicating with other devices.

port carrier
A carrier in a multicarrier cabinet or a single-carrier cabinet containing port circuit packs, power units, and service circuits. Also called a port cabinet in a single-carrier cabinet.

port network (PN)
A cabinet containing a TDM bus and packet bus to which the following components are connected: port circuit packs, one or two tone-clock circuit packs, a maintenance circuit pack, service circuit packs, and (optionally) up to four expansion interface (EI) circuit packs in DEFINITY ECS. Each PN is controlled either locally or remotely by a switch processing element (SPE). See also expansion port network (EPN) and processor port network (PPN).

port-network connectivity
The interconnection of port networks (PNs), regardless of whether the configuration uses direct or switched connectivity.

PPM
1. Parts per million
2. Periodic pulse metering

PPN
See processor port network (PPN).

PRI
See Primary Rate Interface (PRI).

primary extension
The main extension associated with the physical voice or data terminal.

Primary Rate Interface (PRI)
A standard ISDN frame format that specifies the protocol used between two or more communications systems. PRI runs at 1.544 Mbps and, as used in North America, provides 23 64-kbps B-channels (voice or data) and one 64-kbps D-channel (signaling). The D-channel is the 24th channel of the interface and contains multiplexed signaling information for the other 23 channels.

PRI endpoint (PE)
The wideband switching capability introduces PRI endpoints on switch line-side interfaces. A PRI endpoint consists of one or more contiguous B-channels on a line-side T1 or E1 ISDN PRI facility and has an extension. Endpoint applications have call-control capabilities over PRI endpoints.

principal
A terminal that has its primary extension bridged on one or more other terminals.

principal (user)
A person to whom a telephone is assigned and who has message-center coverage.

private network
A network used exclusively for the telecommunications needs of a particular customer.

private network office code (RNX)
The first three digits of a 7-digit private network number.

PROCR
Processor

processor carrier
See control carrier.

processor data module (PDM)
A device that provides an RS-232C DCE interface for connecting to data terminals, applications processors (APs), and host computers, and provides a DCP interface for connection to a communications system. See also modular processor data module (MPDM).

processor port network (PPN)
A port network controlled by a switch-processing element that is directly connected to that PN's TDM bus and LAN bus. See also port network (PN).

processor port network (PPN) control carrier
A carrier containing the maintenance circuit pack, tone/clock circuit pack, and SPE circuit packs for a processor port network (PPN) and, optionally, port circuit packs.

Property Management System (PMS)
A stand-alone computer used by lodging and health-services organizations for services such as reservations, housekeeping, and billing.

protocol
A set of conventions or rules governing the format and timing of message exchanges to control data movement and correction of errors.

PSC
Premises service consultant

PSDN
Packet-switch public data network

PT
Personal terminal

PTC
Positive temperature coefficient

PTT
Postal Telephone and Telegraph

public network
The network that can be openly accessed by all customers for local and long-distance calling.

pulse-code modulation (PCM)
An extension of pulse-amplitude modulation (PAM) in which carrier-signal pulses modulated by an analog signal, such as speech, are quantized and encoded to a digital, usually binary, format.

Q

QPPCN
Quality Protection Plan Change Notice

OSIG
QSIG is a set of open standards for Enterprise networking. It is a protocol defining message exchanges. It includes a basic call setup procedure as well as a list of supplementary services.

quadrant
A group of six contiguous DS0s in fixed locations on an ISDN-PRI facility. Note that this term comes from T1 terminology (one-fourth of a T1), but there are five quadrants on an E1 ISDN-PRI facility (30B + D).

queue
An ordered sequence of calls waiting to be processed.

queuing
The process of holding calls in order of their arrival to await connection to an attendant, to an answering group, or to an idle trunk. Calls are automatically connected in first-in, first-out sequence.

R

RAM
See random-access memory (RAM).

random-access memory (RAM)
A storage arrangement whereby information can be retrieved at a speed independent of the location of the stored information.

RBS
Robbed-bit signaling

RC
Radio controller

RCL
Restricted call list

read-only memory (ROM)
A storage arrangement primarily for information-retrieval applications.

recall dial tone
Tones signalling that the system has completed a function (such as holding a call) and is ready to accept dialing.

redirection criteria
Information administered for each voice terminal's coverage path that determines when an incoming call is redirected to coverage.

Redirection on No Answer
An optional feature that redirects an unanswered ringing ACD call after an administered number of rings. The call is then redirected back to the agent.

remote home numbering-plan area code (RHNPA)
A foreign numbering-plan area code that is treated as a home area code by the Automatic Route Selection (ARS) feature. Calls can be allowed or denied based on the area code and the dialed CO code rather than just the area code. If the call is allowed, the ARS pattern used for the call is determined by these six digits.

Remote Operations Service Element (ROSE)
A CCITT and ISO standard that defines a notation and services that support interactions between the various entities that make up a distributed application.

REN
Ringer equivalency number

reorder tone
A tone to signal that at least one of the facilities, such as a trunk or a digit transmitter, needed for the call was not available.

report scheduler
Software that is used in conjunction with the system printer to schedule the days of the week and time of day that the desired reports are to be printed.

RFP
Request for proposal

RHNPA
See remote home numbering-plan area code (RHNPA).

RINL
Remote indirect neighbor link

RISC
Reduced-instruction-set computer

RLT
Release-link trunk

RMATS
Remote Maintenance, Administration, and Traffic System

RNX
Route-number index (private network office code)

ROM
See read-only memory (ROM).

RPN
Routing-plan number

RS-232C
A physical interface specified by the Electronic Industries Association (EIA). RS-232C transmits and receives asynchronous data at speeds of up to 19.2 kbps over cable distances of up to 50 feet.

RS-449
Recommended Standard 449

RSC
Regional Support Center

ROSE
See Remote Operations Service Element (ROSE).

S

S1
The first logical signalling channel of DCP. The channel is used to provide signaling information for DCP's I1 channel.

S2
The second logical signaling channel of DCP. The channel is used to provide signaling information for DCP's I2 channel.

SABM
Set Asynchronous Balance Mode

SAC
Send All Calls

SAKI
See sanity and control interface (SAKI).

sanity and control interface (SAKI)
A custom VLSI microchip located on each port circuit pack. The SAKI provides address recognition, buffering, and synchronization between the angel and the five control time slots that make up the control channel. The SAKI also scans and collects status information for the angel on its port circuit pack and, when polled, transmits this information to the archangel.

SAT
System access terminal

SCC
1. See single-carrier cabinet.
2. Serial communications controller

SCD
Switch-control driver

SCI
Switch communications interface

SCO
System control office

SCOTCH
Switch Conferencing for TDM Bus in Concentration Highway

SCSI
See small computer system interface (SCSI).

SDDN
Software-Defined Data Network

SDI
Switched Digital International

SDLC
Synchronous data-link control

SDN
Software-defined network

SFRL
Single-frequency return loss

SID
Station-identification number

simplex system
A system that has no redundant hardware.

simulated bridged appearance
The same as a temporary bridged appearance; allows the terminal user (usually the principal) to bridge onto a call that had been answered by another party on his or her behalf.

single-carrier cabinet
A combined cabinet and carrier unit that contains one carrier. See also Multicarrier cabinet.

single-line voice terminal
A voice terminal served by a single-line tip and ring circuit (models 500, 2500, 7101A, 7103A).

SIT
Special-information tones

small computer system interface (SCSI)
An ANSI bus standard that provides a high-level command interface between host computers and peripheral devices.

SMDR
Station Message Detail Recording, known as Call Detail Recording in DEFINITY ECS.

SN
Switch Node

SNA
Systems Network Architecture

SNC
Switch Node Clock

SNI
Switch Node Interface

SNMP
Simple Network Management Protocol

software
A set of computer programs that perform one or more tasks.

SPE
Switch Processing Element

SPID
Service Profile Identifier

split
See ACD work mode.

split condition
A condition whereby a caller is temporarily separated from a connection with an attendant. A split condition automatically occurs when the attendant, active on a call, presses the start button.

split number
The split's identity to the switch and BCMS.

split report
A report that provides historical traffic information for internally measured splits.

split (agent) status report
A report that provides real-time status and measurement data for internally measured agents and the split to which they are assigned.

SSI
Standard serial interface

SSM
Single-site management

SSV
Station service

ST3
Stratum 3 clock board

staffed
Indicates that an agent position is logged in. A staffed agent functions in one of four work modes: Auto-In, Manual-In, ACW, or AUX-Work.

STARLAN
Star-Based Local Area Network

Station Message Detail Recording (SMDR)
An obsolete term now called CDR — a switch feature that uses software and hardware to record call data. See Call Detail Recording (CDR).

standard serial interface (SSI)
A communications protocol developed for use with 500-type business communications terminals (BCTs) and 400-series printers.

status lamp
A green light that shows the status of a call appearance or a feature button by the state of the light (lit, flashing, fluttering, broken flutter, or unlit).

stroke counts
A method used by ACD agents to record up to nine customer-defined events per call when CMS is active.

SVN
Security-violation notification

switch
Any kind of telephone switching system. See also communications system.

switchhook
The buttons located under the receiver on a voice terminal.

switch-node (SN) carrier
A carrier containing a single switch node, power units, and, optionally, one or two DS1 converter circuit packs. An SN carrier is located in a center-stage switch.

switch-node (SN) clock
The circuit pack in an SN carrier that provides clock and maintenance alarm functions and environmental monitors.

switch-node interface (SNI)
The basic building block of a switch node. An SNI circuit pack controls the routing of circuit, packet, and control messages.

switch-node link (SNL)
The hardware that provides a bridge between two or more switch nodes. The SNL consists of the two SNI circuit packs residing on the switch nodes and the hardware connecting the SNIs. This hardware can include lightwave transceivers that convert the SNI's electrical signals to light signals, the copper wire that connects the SNIs to the lightwave transceivers, a full-duplex fiber-optic cable, DS1 converter circuit cards and DS1 facilities if a company does not have rights to lay cable, and appropriate connectors.

switch-processing element (SPE)
A complex of circuit packs (processor, memory, disk controller, and bus-interface cards) mounted in a PPN control carrier. The SPE serves as the control element for that PPN and, optionally, for one or more EPNs.

SXS
Step-by-step

synchronous data transmission
A method of sending data in which discrete signal elements are sent at a fixed and continuous rate and specified times. See also association.

SYSAM
System Access and Administration

system administrator
The person who maintains overall customer responsibility for system administration. Generally, all administration functions are performed from the Management Terminal. The switch requires a special login, referred to as the system administrator login, to gain access to system-administration capabilities.

system printer
An optional printer that may be used to print scheduled reports via the report scheduler.

system report
A report that provides historical traffic information for internally measured splits.

system-status report
A report that provides real-time status information for internally measured splits.

system manager
A person responsible for specifying and administering features and services for a system.

system reload
A process that allows stored data to be written from a tape into the system memory (normally after a power outage).

T

T1
A digital transmission standard that in North America carries traffic at the DS1 rate of 1.544 Mbps. A T1 facility is divided into 24 channels (DS0s) of 64 kbps. These 24 channels, with an overall digital rate of 1.536 Mbps, and an 8-kbps framing and synchronization channel make up the 1.544-Mbps transmission. When a D-channel is present, it occupies channel 24. T1 facilities are also used in Japan and some Middle-Eastern countries.

TAAS
Trunk Answer from Any Station

TABS
Telemetry asynchronous block serial

TAC
Trunk-access code

tandem switch
A switch within an electronic tandem network (ETN) that provides the logic to determine the best route for a network call, possibly modifies the digits outpulsed, and allows or denies certain calls to certain users.

tandem through
The switched connection of an incoming trunk to an outgoing trunk without human intervention.

tandem tie-trunk network (TTTN)
A private network that interconnects several customer switching systems.

TC
Technical consultant

TCM
Traveling class mark

TDM
See time-division multiplexing (TDM).

TDR
Time-of-day routing

TEG
Terminating extension group

terminal
A device that sends and receives data within a system. See also administration terminal.

tie trunk
A telecommunications channel that directly connects two private switching systems.

time-division multiplex (TDM) bus
A bus that is time-shared regularly by preallocating short time slots to each transmitter. In a PBX, all port circuits are connected to the TDM bus, permitting any port to send a signal to any other port.

time-division multiplexing (TDM)
Multiplexing that divides a transmission channel into successive time slots. See also multiplexing.

time interval
The period of time, either one hour or one-half hour, that BCMS measurements are collected for a reports.

time slice
See **time interval**.

time slot
64 kbps of digital information structured as eight bits every 125 microseconds. In the switch, a time slot refers to either a DS0 on a T1 or E1 facility or a 64-kbps unit on the TDM bus or fiber connection between port networks.

time slot sequence integrity
The situation whereby the N octets of a wideband call that are transmitted in one T1 or E1 frame arrive at the output in the same order that they were introduced.

to control
An application can invoke *Third Party Call Control* capabilities using either an adjunct-control or domain-control association.

to monitor
An application can receive *event reports* on an active-notification, adjunct-control, or domain-control association.

TOD
Time of day

tone ringer
A device with a speaker, used in electronic voice terminals to alert the user.

TOP
Task-oriented protocol

trunk
A dedicated telecommunications channel between two communications systems or COs.

trunk allocation
The manner in which trunks are selected to form wideband channels.

trunk-data module
A device that connects off-premises private-line trunk facilities and DEFINITY ECS. The trunk-data module converts between the RS-232C and the DCP, and can connect to DDD modems as the DCP member of a modem pool.

trunk group
Telecommunications channels assigned as a group for certain functions that can be used interchangeably between two communications systems or COs.

TSC
Technical Service Center

TTI
Terminal translation initialization

TTR
Touch-tone receiver

TTT
Terminating trunk transmission

TTTN
See tandem tie-trunk network (TTTN).

TTY
Teletypewriter

U

UAP
Usage-allocation plan

UART
Universal asynchronous transmitter

UCD
Uniform call distribution

UCL
Unrestricted call list

UDP
See Uniform Dial Plan (UDP).

UL
Underwriter Laboratories

UM
User manager

Uniform Dial Plan (UDP)
A feature that allows a unique 4- or 5-digit number assignment for each terminal in a multiswitch configuration such as a DCS or main-satellite-tributary system.

UNMA
Unified Network Management Architecture

UNP
Uniform numbering plan

UPS
Uninterruptible power supply

USOP
User service-order profile

UUCP
UNIX-to-UNIX Communications Protocol

UUI
User-to-user information

V

VAR
Value-added reseller

VDN
See vector directory number (VDN).

vector directory number (VDN)
An extension that provides access to the Vectoring feature on the switch. Vectoring allows a customer to specify the treatment of incoming calls based on the dialed number.

vector-controlled split
A hunt group or ACD split administered with the vector field enabled. Access to such a split is possible only by dialing a VDN extension.

VIS
Voice Information System

VLSI
Very-large-scale integration

VM
Voltmeter

VNI
Virtual nodepoint identifier

voice terminal
A single-line or multiappearance telephone.

W

WATS
See Wide Area Telecommunications Service (WATS).

WCC
World-Class Core

WCR
World-Class Routing

WCTD
World-Class Tone Detection

WFB
Wireless fixed base

Wide Area Telecommunications Service (WATS)
A service in the United States that allows calls to certain areas for a flat-rate charge based on expected usage.

wideband
A circuit-switched call at a data rate greater than 64 kbps. A circuit-switched call on a single T1 or E1 facility with a bandwidth between 128 and 1536 (T1) or 1984 (E1) kbps in multiples of 64 kbps. H0, H11, H12, and N x DS0 calls are wideband.

wideband access endpoint
Access endpoints, extended with wideband switching to include wideband access endpoints. A wideband access endpoint consists of one or more contiguous DS0s on a line-side T1 or E1 facility and has an extension. The Administered Connections feature provides call control for calls originating from wideband access endpoints.

wink-start tie trunk
A trunk with which, after making a connection with a distant switching system for an outgoing call, the system waits for a momentary signal (wink) before sending the digits of the called number. Similarly, on an incoming call, the system sends the wink signal when ready to receive digits.

work mode
One of four states (Auto-In, Manual-In, ACW, AUX-Work) that an ACD agent can be in. Upon logging in, an agent enters AUX-Work mode. To become available to receive ACD calls, the agent enters Auto-In or Manual-In mode. To do work associated with a completed ACD call, an agent enters ACW mode.

work state
An ACD agent may be a member of up to three different splits. Each ACD agent continuously exhibits a work state for every split of which it is a member. Valid work states are Avail, Unstaffed, AUX-Work, ACW, ACD (answering an ACD call), ExtIn, ExtOut, and OtherSpl. An agent's work state for a particular split may change for a variety of reasons (example: when a call is answered or abandoned, or the agent changes work modes). The BCMS feature monitors work states and uses this information to provide BCMS reports.

write operation
The process of putting information onto a storage medium, such as a hard disk.

WSA
Waiting session accept

WSS
Wireless Subscriber System

Z

ZCS
Zero Code Suppression

Index

Numerics

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